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UNPROFITABLE INFRINGEMENT NO EXCUSE.

THE decision of the United States Court of Appeals in the Grant patent case, some account of which appears in this number, is one of far-reaching importance, not only to the tire trade, but every branch of business which in any way relies upon patents which may be the subjects of infringements.

The question of the amount of damages due the patentee has always been a mooted one. Usually such damages have been limited to the amount of profits made by the infringers, or to such damages as could be distinctly shown, based on license fees, loss of sales or diminution of price, caused by such infringing competition. This has, time and time again, resulted in completely nullifying such verdicts, owing to the difficulty of proving that the infringers made any profit, or that the patentees would have made sales, had there been no infringers in the field. Then again, in case the patentee did not grant licenses, the basis for damages for loss of license fees could not be computed.

This decision, however, is to the effect that a plaintiff in an infringement case may recover what to the court or jury seems fair and reasonable, whether the defendant may or may not have made any profits, whether the defendant did or did not grant licenses and without the necessity, on the part of the defendant, of actually proving loss of sales or reduction of price because of the infringement.

DEMONSTRATIVE PUBLICITY.

AS a rule, public opinion is influenced through certain means of publicity, by letters sent direct to individuals, by pamphlets distributed where they will do the most good, by newspaper articles, and by public meetings and eloquent speakers. A certain proportion of the people are influenced by these, but while each and all are to a certain extent effective, there are many people, particularly among certain classes, who are not reached by such exploitation. A band of music followed by marching men attracts the attention of such, and sets them to thinking, much as the printed propaganda does the other classes. That is why a parade is a good thing. It brings publicity to a movement. Former parades of this kind have been beneficial in influencing public thought. The preparedness parade to be held in New York next week is of value in extending public thought on this important question. As in the past, the rubber trade will do its share in making the parade a success. Indeed, it is said that it will contribute between two and three thousand to the ranks of marching men.

THE SOLVENT NAPHTHA PROBLEM.

THE price of gasolene, which is a present subject of comment, investigation and speculation, is a very vital question to rubber manufacturers. The fact that they use automobiles and motor trucks, which cost much more to operate, is of minor importance. Where the shoe really pinches is the greatly increased price of solvent naphtha, and—this is problematical—the lessened use of tires, inner tubes and motor accessories that may come through a letting up in general motoring.

Naphtha ,from the days of Macintosh, has been almost a necessity in rubber manufacture. The lines most dependent upon it are cements for leather shoe manufacture and tire repair; dipped goods; spreader work, as proofing, rubber clothing and mackintoshes; rubber footwear; tires; druggists' sundries and mechanical rubber goods. Indeed wherever any union of parts is desired, naphtha is the usual agent to bring it about.

The gasolene production in the United States for 1915 was 41,600,000 gallons. Of this, 6,500,000 gallons was exported, leaving 35,100,000 gallons for home consump-

tion. Foljambe, of the S. A. E., estimates that the automobile trade will need 42,000,000 gallons for 1916, and that other industrial uses will call for 21,000,000 gallons.

The users of this amount will be motor boats, stationary internal combustion engines, dry cleaning establishments, rubber manufacturers and chemical manufacturers. Just what proportion of this is used in the rubber trade is only a guess. Supply men off hand say from 4,000,000 to 5,000,000 gallons. Rubber manufacturers think it is very much more. One who uses 3,000 gallons a day puts the amount at twice 4,000,000.

Whatever the amount needed, the increased price is serious, not only to the dipped goods, spreader and cement producers, but to all rubber manufacturers. With cheap gasolene it has hardly been thought worth while to try to recover the solvent which evaporates. Now, however, in spreader work, that will undoubtedly be done more or less completely in the near future.

The price of gasolene, which was as low as 9 cents a gallon in 1911, gradually rose to 16 cents, dropped back to 13 cents, and finally rose to 20 cents and is now 28 cents. Nor is there any immediate relief promised. Of other solvents in sight, benzol is that to which the trade, in normal times, would turn. But its use in warfare has put its price so high that it is at present out of reach.

In the meantime, economy in the use of gasolene, governmental investigations and cracking processes, may keep the price down to its present level. Of course, continued high prices would, in time, stimulate the production of gasolene from natural gas and from the shales, or the establishment of benzol plants simply for rubber use. But all that takes time and the plants devoted to such work might not be able to compete when gasolene returns to its ten cent level.

PRACTICAL PATRIOTISM.

THERE have been many Americans who, honest and fair in their dealings with individuals, have taken every advantage of the government. "The State has no friends" was a proverb among such. The same has been true of corporations big and little. That a decided awakening has come about, however, is shown by the work that many business men, heretofore indifferent, are doing to make the country better. This is not confined to any one industry, but a notable case points these remarks, and it is in the rubber trade, too.

The Federal Government needed much expert advice in connection with aeronautics, such as balloon fabrics. No money was available for such work. The splendidly equipped research laboratory of one of the great rubber corporations was at once put at the service of the government, without cost, and the problems solved. Such willing, broad-gage patriotic service is one of the most hopeful signs of the times.

THE SEPTENNIS SYNTHETICUS.

IT is a disease that occurs in the rubber trade at frequent intervals, but in its most virulent form about once in seven years. Since the discovery of vulcanization it has broken out badly ten times. The symptoms are profound secrecy, feverish avarice and alternating fits of marked exaltation and deep depression. Its victims are capitalists, half-educated chemists, occasional rubber manufacturers, widows and orphans. It breaks out in widely separated localities. Massachusetts, New Jersey, New York, Ohio have been afflicted at intervals and have both recovered and suffered relapses. At the moment of writing the disease has broken out in Brooklyn. The attack is in this instance not of the most virulent type. One patient is still in a very feverish condition and bewails the loss of some $31,000. Another, possibly under temporary aberration, has disappeared leaving only a huge tank containing a sticky tar-like mixture. Federal specialists, having been called promptly, hope to localize the outbreak and predict speedy convalescence if not recovery—of the money.

COLOR IN TIRES.

THE non-technical press is at the moment questing for information as to how tires are colored. A non-conscientious expert could flood the country with the statement that tire colors were obtained by dyeing after vulcanization, or by the chemical action of the violet ray, and the tale would obtain credence.

Instead, the reply is after this fashion, although the analogy is not quite perfect: For white bread the baker uses white flour; for brown bread, brown; for black bread, black. And if red bread were desirable red flour would be used. So with tires, white rubber tires contain white flour (zinc oxide); black tires, black flour (carbon black); red tires, red flour (sulphuret of antimony). There are, to be sure, many other whites, blacks and reds that may be used, but the principle remains the same. The rubber dough is simply colored by mixing a dry color in it before baking.

ONE OF OUR INTERESTING AND POLYSYNTHETIC CONTEMPORARIES advises purchasers of rubber packing to insist upon the floating test as a guide to its value. In other words, pure rubber and sulphur is what the writer believes the buyer should aim to secure. The facts, however, run a trifle contrary to such assumption. Sponge rubber floats, also rubber compounded with floating substitute, and would last about as long in steam as a slice of Swiss cheese. On the other hand, rubber weighted down with plumbago, asbestos, infusorial earth, and other heat resisters, while it will sink like lead in water, will outlast and outpack anything else in the world. But then, no engineer would try the test anyhow. He buys of a friendly salesman who has bully cigars and never mentions water.

The Manufacture of Balloon Fabrics in Europe.

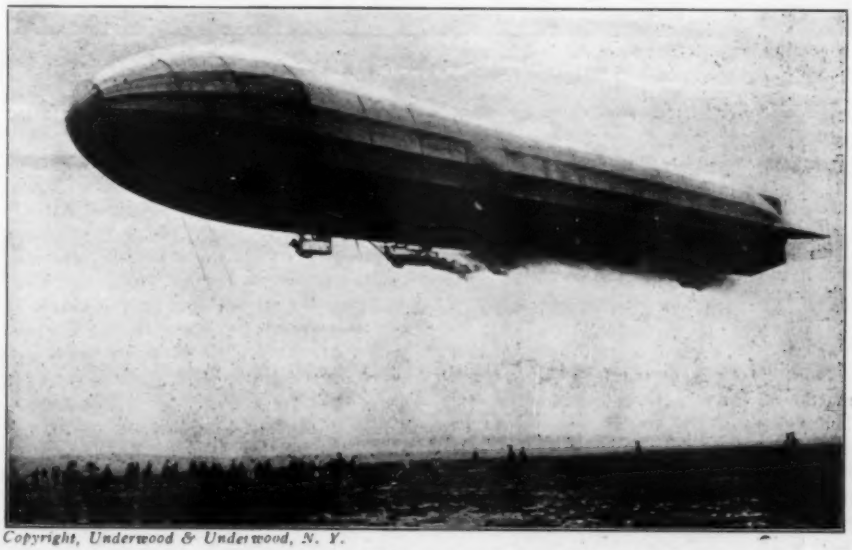
*Special Correspondence.**

DOUBLING.

LINED or "doubled" fabric is so made that each of the fabrics which are brought together is coated separately, one sufficiently to be gas-proof, the other but lightly gummed. After being prepared in this manner the fabrics are passed together through a "doubler," and vulcanized.

A buffing calender is used in lining balloon fabrics, this calender being composed of two hardened steel cylinders. The under cylinder is geared, while the upper one is free and presses on the lower one. The pressure between the cylinders is adjusted by weights and springs. It must be perfectly regulated, as excessive pressure causes wrinkles to form in the fabric, while insufficient pressure causes the cylinders to draw the fabrics at varying speeds and the finished material has a tendency to separate.

The sheet of fabric coated with the thick gas-proof solution must pass over the upper cylinder of the calender, while the sheet coated with the thin solution passes over the lower one. In Germany they prefer to line or double their balloon material with diagonal warp fabrics. In France, on the contrary, straight-thread fabrics are usually employed for this purpose; in the latter case, the warp as well as the weft threads of both plies of fabric are parallel to each other. Great care must be exercised in calendering straight-thread combinations. The threads of both layers must be perfectly parallel and the tension on the fabrics must be even, for should some threads be tighter than others they will be subjected to a greater strain when in use and their tensile strength will be impaired. They also will warp and endanger the rubber connection between the layers of fabric. The total tensile strength of a doubled fabric is never equal to the sum of the tensile strengths of each layer; and diagonally-lined fabrics are not as strong as fabrics lined parallel, because of the fact that it is almost impossible to obtain even tension throughout. By tearing a sample of diagonally lined fabric it is quite evident how irregular this fabric really is. But diagonal or cross-thread linings have their advantages. For instance, these will not allow a rent to spread so easily as in the case of parallel-thread fabrics, and are more perfectly gas-proof.



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A LATE TYPE OF ZEPPELIN IN FLIGHT (RIGID).

VULCANIZATION.

Heat-cured balloon fabrics are vulcanized in steam or in a steam-jacketed vulcanizer in hot air under pressure. The latter method is employed when colors used are sensitive to the effects of steam, also for silk and flax fabrics which cannot stand steam. When ready for steam vulcanization the balloon fabric is wound on a hollow iron drum, about 5 yards in circumference, and open at both ends. This drum is first covered with several layers of thick, rubber-coated fabric, which are vulcanized at the same time with the balloon fabric. The object of these extra layers is to protect the balloon fabric from any steam that might find its way through the rivet holes of the drum and also prevent over-vulcanization of the lower layers of balloon fabric. Previous to wrapping, the rubberized surfaces are thoroughly powdered with talc. In fabric colored with chrome yellow it is essential that it be wound so that yellow comes upon yellow, even if the material only has one intermediary coat of rubber. Wrapped in this manner, fabrics colored with lead chromate give better colors than if the yellow surface had come in contact with the layer of rubber while being vulcanized.

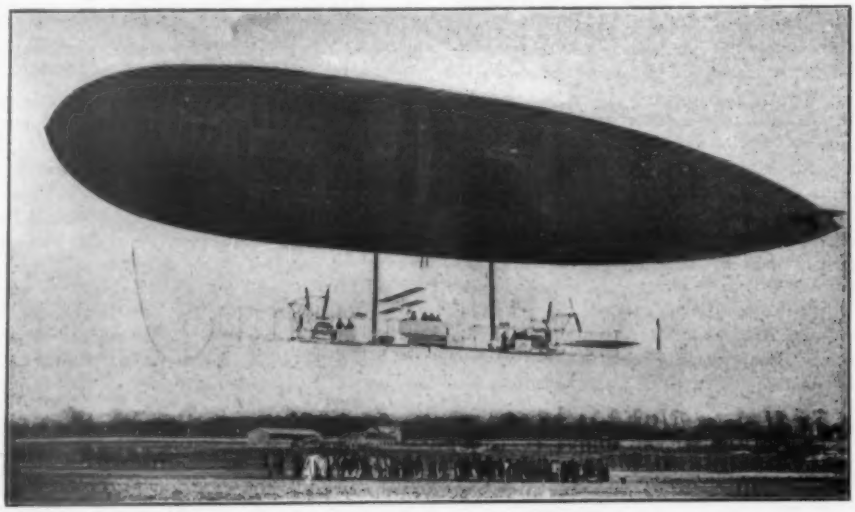
Should the color of the rubber-coated inner surface be damaged, it is of but little consequence, but for the outer side, which ultimately will be the outside of the balloon, it is essential that the material be perfectly uniform and yellow in color. Several layers of fabric rubberized on one side, or several plies of material rubberized on both sides, are wound with the balloon fabric so that the rubberized surfaces of the latter are wound against rubberized surfaces. Talc prevents sticking. Several layers of material, rubberized on one side only, are also wound over the whole, to prevent steam reaching the balloon fabric. When dry air vulcanization is used the rubberized coverings are not necessary and a few layers of ordinary material afford sufficient protection, except in cases where chrome yellow is used for coloring, when it is preferable to retain the gummed wrappings, for the least humidity that might penetrate to the fabric during vulcanization would decompose the lead chromate.

Once wound on the hollow iron drum, the whole is run into the vulcanizer on a truck and the door is closed. The length of time necessary for vulcanization varies with the thickness of the materials and the thickness of the rubber coating, as well as with the length of the piece, *i. e.*, the number of plies wound around the drum. Dry steam vulcanization may require from 50 to 90 minutes and the temperature should never be allowed to exceed 133 degrees C. (342 degrees F.). When vulcanization is finished the drum is run out and allowed to stand until the fabric is completely cool. Upon being removed from the vulcanizing drum the fabric should be thoroughly powdered with talc and then carefully brushed. Fine paraffined talc should be used. Dry vulcanization in a jacketed heater is difficult, as the heat often fails to penetrate all the layers of fabric. If vul-

*The second installment of this article has just come to hand, having been unavoidably delayed.

canization is pushed too rapidly the outer layers are vulcanized before there is any action at all on the inner layers. A sheet of tin-foil inserted between the layers of fabric, and just as wide and as long as the fabric, will remedy this trouble and bring about uniform vulcanization. Even by injecting hot air under pressure into the heater good results would not be obtained, because the fabric is a poor conductor of heat. Low temperature and slow progressive vulcanization are therefore necessary. Even with this method there are differences in the degree of vulcanization of the several layers of fabric.

The old time dry heater is better. In this the material is hung in the heater and slowly and evenly vulcanized. In this connection, Worrington's continuous vulcanization oven is worthy of special mention. This heater, which is popular in England, has a quadrangular chamber 9 feet long and 15 feet high, at the top and bottom of which geared rollers are arranged. The fabric is placed on a drum outside of the chamber, into which it is drawn by an endless chain through a slit in the walls. The fabric comes out of the heating chamber through another slit at the top, and is again wound on a large drum. The chamber is heated by steam pipes and the fabric passes slowly through it, making zig-zags over rollers. It takes the fabric from 2 to 3 hours to go through this vulcanizer.



"Capitaine Feber" (French Non-Rigid).

For very fine fabrics cold vulcanization is preferable. The usual process is that of a solution of chloride of sulphur in bisulphide of carbon. It is commonly held that fabrics vulcanized in this manner do not last. This is often true, though not always. Failure should not be attributed to the method but to the mixture of the solution with ingredients which do not act properly in contact with chloride of sulphur. Account must be taken of the fact that chloride of sulphur creates reactions with other materials than rubber. Oxide of zinc and hydrated lime must be left out when chloride of sulphur is used, for they give bad results. The rapidity with which chloride of sulphur adds itself to rubber depends upon the degree of penetration of the solvent. As a solvent carbon bisulphide has proven best because its boiling point is constant and not too high (being below 212 degrees F.). Further, it swells the rubber, penetrating it faster than the chloride can vulcanize it, and thus an even, regular vulcanization is obtained.

If the boiling point of the solvent is too low the rubber may not be very deeply penetrated; concentration increases very rapidly and the speed of the reaction between the chloride and the rubber is much increased. For this reason a homogeneous vulcanization cannot be expected. A too rapid evaporation of the solvent lowers the temperature of the surface, a sort of dew forms on the surface of the rubber, which decomposes the chloride of sulphur. Naphtha has no constant boiling point; it does not penetrate the layer of rubber fast enough and should not be used. Benzol can only be used in a very pure state and then, like tetra-chloride of carbon, it is too expensive. It is important that the bisulphide of carbon and the chloride of sulphur be perfectly dry, for water decomposes the latter, generating hydrochloric acid and sulphur. For cold vulcanization the following installation is necessary: a boxwood cylinder running in a long, narrow wooden trough lined with lead.

A short time before beginning operations for vulcanizing, this trough is filled with a solution of carbon bisulphide and chloride of sulphur composed of from 1 to 2½ parts of the latter for 100 parts of the former. The coated fabric is stretched tight and slides over the cylinder; sufficient liquid being thus taken from the cylinder to cause vulcanization. Next the fabric is passed over a heated drum to evaporate the solvent. Then the material is wound up. The wooden cylinder must be perfectly round and smooth, and must run true, so that the material is evenly coated. Otherwise a sort of marbled effect will be the result. Sometimes a porcelain trough and cylinder are used.

The more the material is wound the greater the speed, because the circumference of the roll is always increasing. But this is of little importance, for the faster the cylinder turns the more vulcanizing liquid it picks up and the shorter the time of contact with the liquid. The material is thus perfectly covered from the beginning to the end.

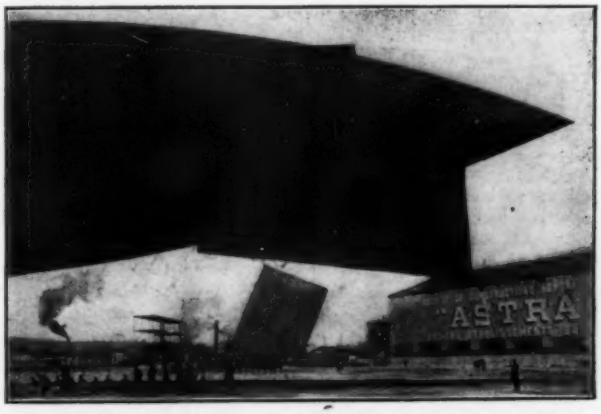
Another method of cold vulcanization is by using the vapors of chloride of sulphur. The web of coated fabric is run up and down on rollers which keep it constantly moving in an air-tight room, just as for hot vulcanization. This room must be wider than the material and provided with a perfect, controllable ventilating system.

Small heaters are placed under tanks containing chloride of sulphur to vaporize it. The temperature of the vulcanizing room must go above 77 degrees F. The vapors must not be generated too close to the material, and it is preferable that they be developed to the side and near the ground. The quantity of chloride of sulphur is based upon the size of the room, the thickness of the rubber coating and the time. A material with 100 grams (3.52) ounces) of inserted rubber is vulcanized in 30 minutes with chloride of sulphur at 5 per cent. When the vulcanization is finished, ventilators are opened, or, better, hot air is blown into the room to drive away the fumes. The material is then hung up to dry 24 hours in another perfectly dry room. Humidity must be avoided. Hydrochloric acid gas which is produced by dampness creates a combination that weakens the fabric by the formation of hydrocellulose. It is not advisable to use ammonia to neutralize the hydrochloric acid, for it has been proven by experience that an excess of ammonia has an unfavorable effect upon the fabric and the rubber coating. After vulcanization the material is measured and its weight to the meter determined.

CAUSES OF DETERIORATION OF BALLOON FABRICS.

Copper or its alloys coming in contact with the sulphurized

rubber of balloon fabrics, forms copper sulphide which rapidly deteriorates the rubber. For this reason, therefore, fittings and accessories should never be allowed to come into contact with the surface of a balloon. Further, rubber that has been handled in copper vessels should never be employed in proofing balloon materials. Even iron, especially when it is rusty, will cause trouble if it is allowed to touch rubberized balloon fabric for any length of time. The enormous surface a balloon offers to the contact of air and light is also a cause for the generation of sulphuric acid in the rubberized fabric of which it is made. One manufacturer attempts to lessen the effects of these agents by adding pitch, asphalt, or paraffin, to the proofing mixtures, but



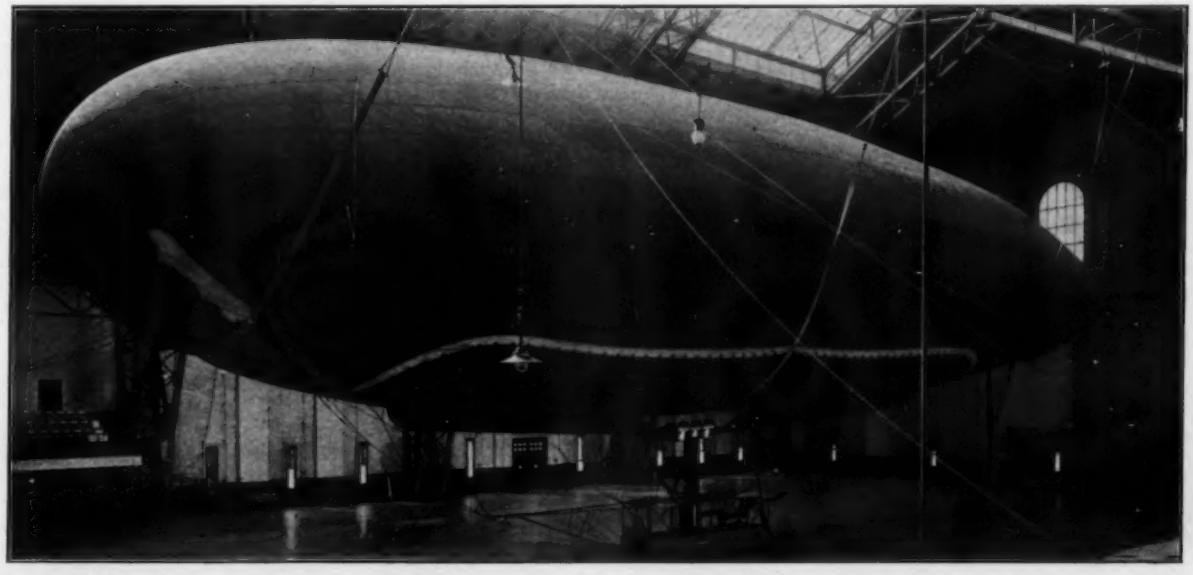
STERN VIEW OF "L'ECLAIREUR CONTÉ" (FRENCH NON-RIGID).

it must also be borne in mind that the purer the rubber the better it will stand air and light. Another cause for the deterioration of balloon fabrics exists in the methods employed in bleaching and preparing the fibers used in the weaving of these materials.

To preserve the balloon itself, it is important that the place where it is kept be as dry and dark as possible. Yellow or red windows are desirable for the shed or hangar in which the balloon or balloon material is to be kept, especially if the windows have an eastern exposure. Balloons should always be dried, like the balloon material, by natural air, but not in the sun.

OUR NEW NAVY DIRIGIBLE.

THE first dirigible owned by the United States Navy is shown here as set up in the State Armory at Hartford, Connecticut. It is the first of several which it is hoped the government will order in its new issue of preparedness. The dirigible is 175 feet long, 35 feet in diameter and 50 feet high. It weighs 5,000 pounds and has a lifting capacity of 2,000 pounds more, or a total of 7,000 pounds. The envelope will contain 150,000 cubic feet of hydrogen and the craft will travel at a speed of 35 miles an hour. The car is 20 feet long and 5 feet wide, and will accommodate a crew of eight. It is built so that it will float on water. Motive power is provided by an 8-cylinder gasolene engine operating two propellers, one on each side of the car. The balloon proper consists of two parts, an outer envelope and two inner balloonetts. The envelope is filled with hydrogen gas and balloonetts are to hold air which is pumped into one or the other or exhausted, as is needed to elevate one or the other end of the balloon that it may rise or descend. The entire strain falls upon the outer envelope, which for this reason is made of a very strong, double texture fabric, about 2,500 yards being required. This fabric was furnished by the United States Rubber Co., and represents a large amount of study, time, effort and expense. The outer fabric is cut in pieces at an angle of 45 degrees from the line of weaving, joined together in a strip the same width as the inner fabric, which is run through straight with a warp when the two, already proofed, are cemented together and vulcanized. Great care has been taken that there are no thick threads or knots, and that it is thoroughly impermeable, no holes even of the smallest possible size being permitted. The inner fabric is dyed green and the outer, orange. It was manufactured under the direction of W. A. Gibbons of the United States Rubber Co.'s general laboratories. The balloonetts are of single texture and of lighter weight, this being feasible as no heavy strain will come upon them. The shaping of the big bags, and the setting up of the balloon was done at the Naugatuck factory of the company. The preparation of the fabric was at the Cambridge factory. We understand that the company is now at work upon other orders for similar fabrics from balloon and aeroplane manufacturers, and that it has quite an extensive and varied line of similar fabrics of single and double texture, in a variety of colors especially suited to such purposes.



UNITED STATES NAVY DIRIGIBLE AIRSHIP DN-1.

Perlman Wins the Demountable Rim Suit.

THE final decision of the courts in favor of Louis H. Perlman establishing the validity of his patents, and enjoining the Standard Welding Co., is of great importance to the automobile trade. The advantages of the demountable rim are self-evident and well-known in the trade. The first public use of this invention was in June, 1905, when Thery substituted a new tire for a damaged one in 80 seconds, an unprecedented feat. He used the invention of Gaston Vinet, patented in March of that year. Szisz won the Grand Prix in 1906 in a Renault car equipped with Vinet rims. About 1907 the Standard Welding Co. and other concerns began making demountable rims.

LOUIS H. PERLMAN.

Louis H. Perlman, of New York City, applied for a patent for a "removable" rim on May 21, 1906. This application was continued and substituted by another filed June 29, in which the word "detachable" was used. Later "demountable" was advised by a patent examiner. Vinet's patent of 1905 was cited by the U. S. Patent Office.

Mr. Perlman conceived the need of some such invention away back in 1900. Several times, while riding in a friend's machine, he shared tire troubles with his host, and three years later the idea of a demountable rim shaped itself in his brain.

Mr. Perlman's first rim was completed by July 1, 1903. The first real road test was on a Royal car in August, 1904, after the preliminary rim had been improved by Mr. Perlman in some particulars. To be brief, Mr. Perlman's solution of the demountable rim problem lay in his invention of the separating wedge, the bolt and the nut, and the use of the short-stem lug and the air space between the rims. His idea was not to obtain the greatest measure of contact between the tire and the wheel rim which had been the aim of others. Although Mr. Perlman believed he had a perfectly original invention when he entered the Patent Office in May, 1906, it was not until February 4, 1913, that his patent No. 1,052,270 was finally granted. For the better part of five years he argued and argued in order to obtain claim No. 10. It took him that time to convince the authorities that he had a mechanical improvement of a patentable character. Then followed more delay before claims Nos. 11, 12 and 13 were allowed. His persistence was needful, because it was upon the infringement of claims 8, 11, 12 and 13 that he filed his memorable suit against the Standard Welding Co. in October, 1913.

Claim No. 8 covers the short-stem lug; and claims 11, 12 and 13 cover the means for locking a demountable rim to a wheel. The importance of these claims so far as the whole industry is concerned is such that they are quoted here in full:

8. The combination of a demountable rim having radially disposed clincher flanges, a tire shoe having beads engaging said flanges, a wedge-shaped clamping plate bearing against said beads and adapted when moved to force said beads against said flanges, and means accessible from the inside of the rim for drawing the clamping plate radially toward the rim.

11. The combination, with a wheel body, of a demountable rim therefor, a locking element, having a tapering portion, that is adapted to be moved radially and to thereby exert pressure against the rim outwardly radially of the wheel body, and to act as a wedge laterally, said locking element having an engagement with the wheel body whereby it may be moved radially of the wheel body.

12. The combination with a wheel and its felly, of a demountable rim therefor, a locking element having a tapering end that is adapted to be moved radially and to thereby act as a wedge laterally and exert pressure against said rim radially of the wheel, said locking element having a threaded engagement with the wheel structure whereby it may be moved radially of the wheel.

13. The combination, with a wheel body, of a demountable rim therefor, and a locking element, having a tapering portion, that is adapted to be moved to exert pressure against the rim outwardly radially of the wheel body, and to act as a wedge laterally, said locking element having an engagement with the wheel body.

Upon appeal by the defendant, the Standard Welding Co., the case was decided in Mr. Perlman's favor by Judge William H. Hunt, of the United States District Court for the Southern District of New York, on August 18, 1915. Later, on February 15 of the present year, the Circuit Court of Appeals unanimously affirmed the decision of the District Court. On March 8, just passed, an injunction was issued by the United States District Court for the Southern District of New York by which the Standard Welding Co., Cleveland, Ohio, is enjoined from the further manufacture and sales of demountable rims. It has been variously stated that the Standard Welding Co. has been producing of late years anywhere between 50 and 60 per cent of the demountable rims supplied to car manufacturers. Its daily production has been stated to be in the neighborhood of 12,000 rims. This gives some idea of the increased demand for this feature of motoring convenience. The very words of the patent claims and the decision of the courts make it clear that almost every demountable rim maker in the country is affected by the suit.

Starting with the Perlman patent of 1906 and tracing the files down to November, 1915, the official records show the issuance of 52 so-called demountable rim patents—that is to say, for rims specifically designated as demountable; but, as a matter of fact, one will find nearer a thousand related rim patents. Curiously, 15 of the demountable rim patents appeared in 1913, the very year that the Perlman patent came out; and there were 13 others of this class, so officially designated, in the succeeding year. In 1915 ten were issued. These facts help to give the reader some idea of the inventive activity in this particular field and show how firm a grip the demountable rim has taken upon both the manufacturer and the motoring populace. While many of these inventions have been developed to a point, and a number of them placed upon the market, still but few of them have survived the test of service. According to one authority, the principal local-wedge types of demountable rims that have received general application are the "Stanweld," "Empire," "Fisk," "Firestone" and "Michelin." Of course, there are others.

The rim problem has engaged the attention of automobile engineers and inventors ever since the machines gained popularity. The files of the United States Patent Office show 746 patents of all classes dealing with rims of one kind or another, and this leads logically to the broad question of the history of rim manufacture. As has been said by one of the foremost rim makers in this country: "There is no question that ease was the greatest force back of the designing of a quick-detachable, demountable

rim. The old style rim, when puncture or blow-out occurred, many times meant hours of work in the putting on of new tires. With many rims it was necessary to send the wheel or car to the garage, before changes could be made. When a car owner started on a tour, or even on a short trip, he never knew whether he would reach his destination or not. All that is a thing of the past. The quick-detachable, demountable rim has removed the principal worry of motorists."

The rise of the demountable rim commercially dates back hardly more than five years when judged by a widespread demand. In the succeeding interval a very large percentage of car owners have either bought machines already equipped with rims of this sort or have later supplied them. This is easily explained. Tire changing has been one of the car owner's most troublesome bugaboos in the past. We have all seen him toiling by the roadside—sometimes under a broiling sun or in a pelting rain. and universally in anything but a pleasant mood. The development of the demountable rim altered all this; it made it possible for a damaged tire to be quickly removed, replaced by a good one, and then carried home to be repaired at leisure. Instead of working for half an hour or more to make a change, the substitution can now easily be effected inside of ten minutes. It is not a case of putting on a new tire and pumping it up, but, instead, the speedy adjustment of a tire already inflated for service. And it is also claimed that the demountable rim obviates the necessity of using over-sized tires, because the wedge feature and the initial loose fit make it simply part of the process to take care of the excess.

The present-day demountable rims are adaptations of the clincher rim of unit construction, so universally employed about fifteen years ago. It will be remembered that the beads of the earlier pneumatic tires were extensible to facilitate seating the tire within the clincher rim. Stability was added to the tire by stiffening or wiring the beads, and as these could not be seated readily within the clincher rim of unit construction, then came the separable rims out of which evolved the different so-called quick detachable rims. But the quick detachable rim did not obviate the pumping up of the new tire, although it did make it possible to remove a damaged tire and to put a good one on the wheel; but the substituted tire had then to be inflated more or less laboriously. A notable gain in convenience and simplicity was secured by the adoption of the demountable rim in place of the purely quick detachable rim, and in time followed what came to be known as the quick detachable, demountable rim. In the case of the demountable rim we have only to loosen a few bolts, six or eight, as the case may be, to make a change, and with equal speed another rim, bearing an inflated tire, can be shoved in place and locked firmly by the bolts.

Mr. Perlman has associated with him in this enterprise men prominent financially, and men well known in the automobile industry. Two manufacturing plants have already been secured and contracts have been signed to supply prominent automobile manufacturers with rims. Mr. Perlman estimates that the requirements for the season of 1917 will amount to one million sets, and he is confident that by August next the company will be in shape to supply that demand.

NATIONAL ASSOCIATION COTTON MANUFACTURERS' ANNUAL MEETING.

The National Association of Cotton Manufacturers held its annual meeting April 26 and 27, at the Copley-Plaza, Boston, Massachusetts. The principal address on Wednesday was by Frank A. Vanderlip of New York City, its subject being "Foreign Commerce in American Textiles."

During the Thursday session many subjects interesting to the textile industry were ably treated in carefully prepared addresses by experts in their several lines of work. In the afternoon, S. W. Stratton, Ph.D., Director, Bureau of Standards, Washington, D. C., read a paper on "Tests of Cotton Yarn and Fabrics," with illustrations. Then followed a paper, "The Washington Conference and Its Relation to Tire Fabric and Other Testing Requirements," by William D. Hartshorne, Chairman of Committee D-13, of the American Society for Testing Materials.

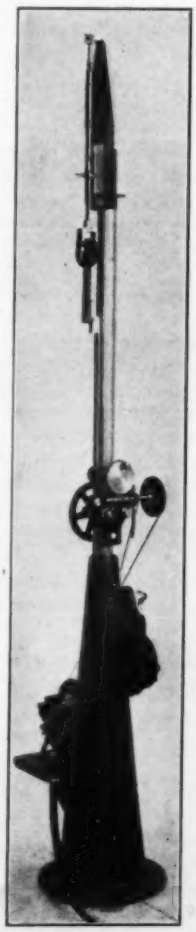
FIFTH NATIONAL TEXTILE EXHIBITION.

The Fifth National Textile Exhibition and Third National Power Shows occupied the Mechanics' Building, Boston, Massachusetts, during the week of April 24-29. A very interesting program was arranged, and the exhibits of textile machinery and allied trades were fully representative of this great industry.

Among the exhibitors the following firms, whose names are well known to readers of THE INDIA RUBBER WORLD, were noted: Curtis & Marble Machine Co., Worcester, Massachusetts; American Tool & Machine Co., General Electric Co., Morse Chain Co., and Westinghouse Electric & Manufacturing Co.—all of Boston, Massachusetts. The exhibition was well attended, and many new and improved forms of mechanism were shown for the first time. The exhibits represented the most important collection of textile machinery that has ever been arranged for public exhibition.

AUTOGRAPHIC FRICTION TESTING MACHINE.

THE Bureau of Standards, Washington, D. C., has developed an autographic machine for testing the adhesion or "friction" between the plies of canvas in rubber hose, belting, etc.



The machine is operated by a ⅛ horsepower worm geared shunt motor, which is belted to a cone pulley. A worm on the pulley shaft drives a worm wheel which is geared to a spur inside of the vertical steel column. This spur drives a steel rack, to the upper end of which is attached the movable grip. From the top of the machine is suspended a spring which carries at its lower end a fork for holding the test piece. Between the spring and fork is a pencil holder, in front of which is a drum carrying a paper chart on which the record is drawn.

The capacity of the spring is 40 pounds, the extension being 1 inch for 10 pounds pull. The drum is driven by a cord which passes over a small guide pulley and thence to a spool on the spur gear shaft. The surface speed of the drum is the same as the rate of separation of the plies of fabric being tested.

The method of testing rubber hose is as follows: a 1-inch section is fitted over a mandrel and placed in the fork suspended from the top of the machine, and the detached end of the fabric is secured to the lower grip as shown.

To test rubber belting, a 1-inch strip containing 2 plies is used; the plies are separated for a short distance and the ends secured in the two grips, the upper grip being a clamp held in the fork above mentioned.

As separation of the plies takes place the pencil makes a continuous record on the drum, showing the adhesion between the plies of fabrics at all points of the fabric being tested.

European Pneumatic Tire Sizes.

FRANCE was the pioneer country in the manufacture of automobile tires and used millimeter dimensions conforming with the metric system which also originated in that country. All Europe followed the French lead by using metric measurements in manufacturing automobile tires.

America entered the field later, but, instead of metric measurements, inch sizes were adopted. So today there are French or metric tire sizes universally used in Europe while inch sizes prevail in America. This state of affairs is regrettable, and the probabilities are that for a long time to come American and European tire makers will continue to use different standards.

Nevertheless, with the tremendous impulse which the war has given to the export trade in American automobiles and automobile tires, and in view of the universal movement in favor of standardization, it is of interest to briefly review the evolution of European practice and tabulate those sizes now generally in use, together with their equivalents in inches.

EUROPEAN SIZES.

Not many years ago, when the automobile industry was still in its experimental stage, practically every constructor built his product entirely in his own shops and made wheels best suited to the general characteristics of his machine, regardless of styles and sizes used by other builders. This resulted in an unlimited range of tire sizes and designs which tire manufacturers were obliged to produce and for which the motorist had to pay.

With the growth of the industry and the desire of automobilists to have a minimum of difficulty in obtaining tubes and casings to fit their machines, automobile makers were gradually obliged to follow the lead of certain large concerns which had many machines in public use and for which dealers could afford to stock tires. In other words small automobile manufacturers, to satisfy their customers had to adopt sizes used by those makes of automobiles that were most widely distributed. This was a first step towards standardization, but the number of tire sizes remained very large.

A leading European automobile tire manufacturer publishes a catalog listing tire casings and inner tubes in 38 different metric dimensions, besides 6 American sizes in inches. Many of these tires are made in an extra strong and heavy variety under the name of limousine tires which are not included in the 38 sizes and this list does not include what are known as oversize tires, that is to say, there is no 815x120 millimeter variant of the 815x105 millimeter tire. So that, taking account of the great number of odd sizes still in use, it can be safely said that at least 50 different sizes of pneumatic automobile tires are now on the European market. The following table gives the European sizes most widely used, together with their equivalents in inch measurements:

FRENCH OR METRIC TIRE SIZES.

Sizes in Millimeters.		Equivalents in Inches.	
Interior Diameter.	Section Diameter.	Interior Diameter.	Section Diameter.
710	90	27.95	3.54
760	90	29.92	3.54
810	90	31.89	3.54
870	90	34.25	3.54
910	90	35.83	3.54
765	105	30.12	4.13
815	105	32.09	4.13
875	105	34.45	4.13
915	105	36.02	4.13
820	120	32.28	4.72
880	120	34.65	4.72
920	120	36.22	4.72
895	135	35.24	5.32
935	135	36.81	5.32

BRITISH PNEUMATIC TIRE STANDARDS.

Many unsuccessful efforts have been made in Europe to standardize tire sizes. The principal reason of this non-success has been because of the number of cars made under old conditions and which are still in use.

In England, during 1913, T. H. Woollen of the Society of Motor Manufacturers and Traders, initiated and carried through the work of reducing the number of standard rim sizes to 20 that would take 38 standard tire sizes. As there were 38 standard tire sizes, and several oversizes as well, with only 20 rims to accommodate them, in many cases two different standard sizes of tires would fit the same rim.

In 1915, the Tire Committee of the S. M. M. T. suggested reducing the number of tire rim sizes to 10 standards while 11 different sizes would be standardized for the tires themselves. Of this range of tires two of the smallest would fit the same rim while for each of the others there would be a corresponding rim. The suggested tire standards are shown in the following table:

PROPOSED BRITISH STANDARD SIZES.

Sizes in Millimeters.		Equivalents in Inches.	
Interior Diameter.	Section Diameter.	Interior Diameter.	Section Diameter.
* 700	80	25.5	3.14
† 700	85	27.5	3.34
† 710	90	27.9	3.54
760	90	29.9	3.54
810	90	31.9	3.54
815	105	32.1	4.13
820	120	32.3	4.72
880	120	34.6	4.72
895	135	35.2	5.31
935	135	36.8	5.31
915	175	36.0	6.88

* Fits 650 x 65 millimeter rims.
† These tires fit the same rim.

These standards are now before the Engineering Standards Committee, a semi-governmental institution which regulates British mechanical and electrical standards, and are now awaiting the final decision of this official body.

COLONIAL SIZES.

The proposed British standards, above given, do not include sizes that are specially made for rough service in the Colonies and known as Colonial sizes. The following sizes are most in demand:

COLONIAL TIRE SIZES.

Sizes in Millimeters.		Equivalents in Inches.	
Interior Diameter.	Section Diameter.	Interior Diameter.	Section Diameter.
1,010	90	39.76	3.54
1,020	120	40.16	4.72
1,080	120	42.52	4.72
1,000	150	39.37	5.91
1,050	150	41.34	5.91

Some British tire manufacturers consider a 915x105 millimeter (36.02x4.13 inches) tire as a Colonial size.

CONTINENTAL EUROPE.

The lessons of the war have emphasized the advantage of standardization, and reports from both France and Germany indicate that serious efforts will be made in these countries at least to standardize tire sizes after the war. All recognize that, although standardization pushed too far may lead to the stifling of originality, it is preferable to a chaos of tire sizes which leads to confusion and difficulty in obtaining air tubes and casings, not to mention the fact that lack of standardization makes tires more costly.

Hard Rubber in Automobile Construction.

THE following interesting and instructive paper by McConnell Shank, manager of the hard rubber department of The B. F. Goodrich Co., Akron, Ohio, was read at the meeting of the Cleveland Section, Society of Automobile Engineers, held at Cleveland, Ohio, December 17, 1915:

Although rubber of the hardness of an automobile bumper or of a solid tire is often referred to as "hard rubber," that term as used in this paper refers to rubber compounds hard enough to be machined and polished. In Europe hard rubber is known as "ebonite." "Vulcanite" was originally a trade name for a certain compound, but is now synonymous with "ebonite" or "hard rubber." "Vulcanized rubber" is a term often applied to such compounds, but speaking accurately, soft as well as hard rubber is vulcanized.

Vulcanized rubber compounds may be hard by reason of either a more complete chemical combination of the rubber with sulphur or the presence of ingredients other than rubber and sulphur. While the degree of hardness is controlled in both ways, the completeness of the combination of the rubber with sulphur is usually the greater factor. The finest grade of soft rubber, such as is found in a good rubber band, may contain 95 per cent rubber and 5 per cent sulphur and may have been vulcanized two hours, at a constant temperature. The finest grade of hard rubber such as is found in a good comb or fountain pen may contain 75 per cent rubber and 25 per cent sulphur and may have been vulcanized ten hours at the same temperature.

PROPERTIES OF PURE HARD RUBBER.

For the many purposes for which hard rubber may be used in automobile construction there are many qualities. The properties of hard rubber vary with the quality, of course. An idea of the properties of the various qualities can best be gained by taking as a standard and noting the variations of what might be called "pure hard rubber," which contains practically no ingredients other than rubber and sulphur.

Pure hard rubber ranges in specific gravity from 1.12 to 1.25. On account of the large percentage of sulphur necessary for proper vulcanization, it is impossible to make hard rubber with a specific gravity much less than 1.12. Hard rubber of fair commercial quality will usually have a specific gravity of 1.25 to 1.40.

The finest grades of hard rubber have a tensile strength as high as 7,000 pounds per square inch of cross section. Battery manufacturers who make tensile tests on their jars usually require a tensile strength around 3,500 pounds.

The United States Navy hard rubber sheet specifications which require a fair commercial quality, call for a dielectric strength of 10,000 volts per 1-32 inch of thickness. Some battery manufacturers test their jars electrically with a pressure of about 25,000 volts alternating current for ¼ inch of thickness. The finest hard rubber will withstand twice that voltage.

Hard rubber compounds, except some that contain organic substances other than rubber, are moisture proof. Pure hard rubber is unaffected by most chemicals. Concentrated nitric and sulphuric acids, carbon bisulphide, aniline and benzol are the only chemicals used largely in a commercial way that affect it at ordinary temperatures. As compared with soft rubber, hard rubber deteriorates slowly.

Hard rubber compounds before they are vulcanized are usually of about the same consistency as soft rubber compounds, that is, they are of about the same consistency as stiff chewing gum.

EFFECTS OF TEMPERATURE VARIATIONS.

Pure hard rubber has a greater coefficient of expansion than most other substances, either organic or inorganic. In cooling from the ordinary temperature of vulcanization to 70 degrees F. it shrinks about 2 per cent. In molding, this shrinkage is not altogether uniform, so that regardless of how accurately the cavities of a mold are finished, the goods have to be turned, ground, buffed or polished after they are molded according to the accuracy of dimensions and character of polish required. The coefficient of expansion of pure hard rubber after it has once cooled is .00004278 per degree F., or about six and a half times that of steel.

At a temperature of 150 degrees F. pure hard rubber softens perceptibly. At 212 degrees F. it becomes so soft that it can be easily bent, and at 240 degrees F. it becomes leathery, so that it can be readily cut with a knife. Upon cooling, it remains in the shape in which it was bent and shrinks slightly from its original size. When warmed again it tends to return to its original shape. Each time it is heated and cooled it shrinks less than the previous time until after a few times the shrinkage is negligible. While this is the effect of heat upon most hard rubber compounds, it is possible to make them withstand the action of heat to a much greater extent by scientific compounding.

On account of its resilience, hard rubber machines less readily than would be expected, but with good grades fine work can be done. In general, the better the grade, the more easily it can be worked. A good quality of hard rubber readily takes a fine jet-black polish. This color and polish are fairly permanent, but not absolutely so, for even the finest quality takes on a slight greenish tint, especially after it has been exposed for a long time to the bright sunlight. When the finish becomes dull or discolored, it can be restored by buffing and polishing.

On account of the large percentage of sulphur in hard rubber compounds, and the comparatively long time and high temperature under which they are vulcanized, it is impossible to make hard rubber in the large variety of colors in which soft rubber can be made, for the high temperature and sulphur tend to discolor pigments. Hard rubber can be made in a commercial way in black, red and intermediate shades. It cannot be made of a clear white color at all, and most of the other colors are not usually attempted.

The quality of hard rubber may be determined roughly by superficial examination in many ways—by its color and texture as shown by a polished or freshly-broken surface, by its strength, by the ease with which it machines, and by the toughness, color and grain of a shaving. The best way is to whittle it slowly with a knife, noting the color and toughness of the shaving. With practice, one can judge hard rubber fairly accurately in this way.

The parts of an automobile that may be made wholly or in part from hard rubber may be divided into three classes—handles, parts for the ignition system and battery parts.

RUBBER HANDLES FOR AUTOMOBILE SERVICE.

In the first classification may be included handles for starting cranks and controller levers, caps for radiators and gasolene tanks, and steering wheels. For these parts hard rubber is desirable on account of its strength, attractiveness and permanence of finish. Hard rubber for handles is usually molded except where the quantity required is so small as not to warrant the expense of a mold.

Hard rubber parts for automobiles are molded in two ways—from soft-metal or from hard-metal molds. Soft-metal molds are made from a matrix. The molds are stacked and clamped in racks and the vulcanization is done in a heater of the type formerly used for tires. Hard-metal molds for hard rubber are usually made from iron or steel the same as are those for bumpers and other soft rubber goods. The vulcanizing is also done in hydraulic presses.

For hard as compared with soft rubber, a long time is required for vulcanization so that for large production a great many mold cavities are required. With a comparatively inexpensive matrix it is an easy matter to make as many molds as may be required, but cavities in an iron or steel mold are expensive. Soft-metal molds have the advantage, therefore, of low cost of mold equipment, but they warp and stretch so that it is impossible to do nearly as accurate work with them as with hard metal molds. Furthermore, they will not withstand pressure and the result is that goods made of the same compound from hard metal molds under hydraulic pressure show greater strength. With hard-metal molds there are less defective goods and the work can be better arranged, so that iron or steel molds are the best, except where the quantity required is small.

Hard rubber steering rims have been used for the past ten years. The first ones were made entirely from hard rubber and screwed on the spiders. The screws did not hold well enough in the hard rubber and this led to the use of a hard rubber covered steel tube, also fastened to the spiders with screws. Objection was then raised to the projections beneath the rim where the arms of the spider joined it. This resulted in the use of the integral construction in which the hard rubber is molded on the rim of the spider. This type of rim is a little heavier than wood and more expensive, but it looks well when new and remains practically unchanged after years of use, without attention of any kind.

The parts in the ignition system that may be made wholly or in part from hard rubber are distributor blocks, collector rings and brush holders for magnetos, terminal connections and miscellaneous parts for magnetos, coils and switches. These parts are molded, as a rule, and the comments already made concerning the superiority of hard-metal over soft-metal molds apply.

It is a comparatively easy matter to make these parts from material that will withstand 10,000 volts per 1-32 inch of thickness and the insulation problem is therefore not difficult. To furnish material that will withstand a jump spark is another problem, for the heat of the spark tends to carbonize the rubber. The Germans are able to furnish a rubber compound that in this respect seems to be superior to any it has been possible to produce in this country.

HARD-RUBBER PARTS FOR BATTERY EQUIPMENT.

Parts for batteries include hard rubber jars, covers, vents, bushings and separators. The more complicated hard rubber covers must be molded. The less complicated ones may be molded or cut from hard rubber sheet. The greater accuracy of dimensions that can be maintained with hard-metal molds is of greater advantage here than in connection with the parts previously mentioned. Most of the other parts must be finished after they are molded in order to give them the required accuracy of dimensions or character of surface. It is customary to grind the edges of molded covers fairly accurately to dimensions, but to leave the other surfaces practically as they come from the molds. To finish the other surfaces would greatly increase the cost of manufacture. In other words, molded covers must be molded fairly accurately, and this can be done more satisfactorily with hard-metal than with soft-metal molds.

Flat covers are usually cut from sheet, but when large in size, and the quantity required is large enough to warrant the cost of equipment, it is often advantageous to mold them. When the same compound is used, a stronger cover can be made by molding than by cutting it from sheet, and this is a factor in determining the better method of manufacture in order to produce a cover of a given quality.

The cost per cover for operating the molds is practically the same, regardless of the size of the cover. Consequently it often happens that of a certain type of flat cover it is most economical to cut the small ones from sheet and to mold the larger ones. Hard rubber sheet from which covers are made is vulcanized between layers of tin in hot water. These sheets are about 20 x 48 inches, the exact size, of course, being determined so that there may be no excessive waste at the edges.

Battery manufacturers are probably more inclined to economize beyond the point of safety in the cost of covers than of other parts of a battery. The hard rubber cover is so small that the addition of a cent or two in the cost of material makes a considerable difference in its strength, and often a cent or two may make a very great difference in the breakage in service.

METHODS OF MAKING VENTS.

There are two types of hard rubber vents in common use, plain molded and blown. The "plain molded" is made in the same manner as the other molded parts previously mentioned. The "blown" vents are made hollow by the expansion of water or other liquids on the inside, this expansion being caused by the application of heat during vulcanization. It is more expensive to mold goods when they are hollow. More expensive material is required. Of course, in some designs it is essential that vents be made hollow, but wherever it is possible in order to reduce costs, vents should be so designed that all holes and irregularities can be made by the means of molds.

Such items as hard rubber terminal bushings and vent extensions are usually cut from hard rubber tubing, although here again if the design is complicated and the quantity involved is large it is more economical to mold them.

Hard rubber rods and tubes are made in much the same manner as soft rubber tubing that does not have cloth insertion. It is squirted through a die while hot, the die forming it into the desired shape. The material is then buried in soapstone, proper care being exercised to insure its being kept straight, the hard rubber rod by the way it is packed, and hard rubber tubing by mandrels on the inside. The standard length for hard rubber rod and tubing is 30 inches. As it comes from the process of vulcanization it is fairly rough and not altogether uniform in dimensions. With a grinding machine of rather simple design, hard rubber rod and tubing can be ground accurately to outside dimensions and polished at no great expense. The actual cost of manufacture, per pound, of ground and polished hard rubber tubing varies according to the weight per foot, that is, according to the diameter and thickness of wall. This is due to the fact that labor cost for grinding and polishing depends upon the length and number of pieces rather than upon the weight. The hole in hard rubber tubing can be kept accurately centered only by turning it on a mandrel in the lathe with a special grinding machine, which, of course, increases the cost considerably.

TYPES OF BATTERY SEPARATORS.

In lighting and starting batteries, hard rubber separators have been almost altogether supplanted by treated-wood separators. Battery manufacturers tell us that with a battery of a given size they can get a higher discharge rate with the wood than with the rubber separators, and that if they used the latter they would have to increase the sizes of their batteries.

Separators manufactured in Europe are usually made from corrugated perforated hard rubber sheet, or from perforated sheet with ribs molded integrally upon it. The corrugated separator is not altogether desirable because it will flatten out in service. The separators with the ribs molded integrally with the sheet have been too expensive for most American battery manufacturers. At the present time, however, hard rubber manufacturers are aiming to reduce their costs of manufacture for that type to a point where battery manufacturers can afford to use them.

Ribbed hard rubber separators as they are made in this country today usually consist of hard rubber sheet partly cured and perforated, and ribs vulcanized on the sheet afterwards. This type of separator is more durable than are the treated wood separators, while the separator with ribs molded integrally is still more durable.

Hard rubber jars as used in this country are formed over mandrels and vulcanized while still on the mandrels. The jars are not put into molds, but are simply wrapped with a layer of tin on the outside. The rubber manufacturer is frequently asked if this wrapping could not be dispensed with, thereby decreasing the cost of manufacture. The tin, however, is not a great item of expense, because it can be used over and over again. It serves to hold the jar in shape during the vulcanizing process, and offers a convenient means for branding, for it is only necessary to make the impression with a die, and that is held by the tin in the compound while the jar is being vulcanized. Without the tin the jar would have a rough instead of a fairly smooth and well polished surface, dimensions could not be so well controlled, and the expense of straightening the jars after vulcanization would just about offset the cost of using the tin.

THICKNESS OF JAR WALLS.

The thickness of wall required for a hard rubber jar in automobile work in order to give the proper service, depends upon the quality of rubber used. Walls ⅛ inch thick are now fairly standard for starting and lighting work. Walls 3/32 inch thick are sufficient, provided the rubber compound is good enough. In fact, 1/16 inch thickness of wall, if only the finest grade of materials were used, might be satisfactory, but so thin a wall is not recommended because such thin material is difficult to handle satisfactorily in the manufacture of a jar, and the percentage of defective jars is too great.

There is a tendency on the part of some battery manufacturers to use walls 3/32 inch thick in the smaller batteries for the smaller and cheaper cars. While the weight per cell of the elements is, of course, smaller for a smaller battery, these batteries are usually used on small cars where the spring suspension relieves the ordinary strains upon a hard rubber jar to a less extent. To give the same service, the hard rubber jar for the small battery should have as thick a wall as in a large battery.

JAR BREAKAGE CAUSED BY ASSEMBLING.

A great deal of the breakage of hard rubber jars in service has been due not to the quality of the jar, but to the way it was assembled. If the wooden boxes are not square and fairly rigid, the bottom of the jar is frequently only partly supported. This is also true where the sealing compound is not distributed uniformly over the bottom of the battery box. In such cases a jar even of good quality will break either at the bottom or in the wall at the point where the top of the bottom rib joins the wall.

PHYSICAL AND ELECTRICAL PROPERTIES.

Many battery and rubber manufacturers have been inclined to talk loosely about tensile strength, elongation and dielectric strength. Statements in this connection mean practically nothing unless all the test conditions are known. To say that a hard rubber jar has a tensile strength of 3,600 pounds or more, does not necessarily mean that it is a serviceable jar. The tensile strength of a jar will vary according to the temperature of the test piece at the time the test is made. The usual temperature is 70 degrees F. At a lower temperature a piece of hard rub-

ber of a given composition and hardness will have a higher, and a piece at a higher temperature, a lower tensile strength.

A tensile test will vary as much as 25 per cent, according to the type of machine upon which the test is made. The faster the pull, the greater will be the tensile strength as indicated by the machine. To insure anything like accurate results, a motor-driven test machine should be used.

Furthermore, the tensile test will vary according to the amount the piece has been vulcanized. A compound that has been vulcanized until it is very hard will have a much higher tensile strength than the same compound vulcanized less. A jar with high tensile strength is usually too hard and brittle to give satisfactory service.

The results of elongation tests will vary according to the shape of the test piece, its temperature and the amount it has been vulcanized. The slower the speed of the test machine, and the higher the temperature, the greater will be the elongation. The harder the compound is vulcanized the smaller will be the elongation. The distance between the jaws of the test machine is usually taken as the basis of elongation tests. If the test piece is of uniform cross section, the percentage of elongation will be lower than if the test piece is of the usual shape, that is, small at the center and large at the ends. There is also the slippage in the jaws to contend with if the distance between the jaws is taken as the basis. To insure accurate elongation tests, the basis should really be the distance between two given points on a piece of uniform cross section.

The electrical test on a hard rubber jar is usually made by placing it on a mandrel inside a frame, the mandrel and frame being respectively the positive and negative poles. The results here will vary according to whether the current used is alternating or direct, the length of time during which the current is applied, and, in the case of alternating current, its frequency.

RIGID SPECIFICATIONS REQUIRED.

When battery manufacturers adopt specifications for hard rubber goods, there is an inclination to make them too rigid. Jars may be rejected that would really be more serviceable than many that might pass the test. A certain specification might call for a tensile strength of 3,600 pounds and an elongation of 3 per cent. A jar might have a much larger percentage of rubber than would be necessary to meet these specifications if it were cured to the degree of hardness necessary to meet them, or might happen to be slightly under-vulcanized so that it would have a tensile strength of only 2,500 pounds or an elongation of as much as 10 per cent. Such a jar, although rejected, would be more serviceable than a jar that would just meet the specifications.

It will be well to add a word of caution regarding the so-called flexible jars. Any rubber manufacturer can furnish a hard rubber jar that is flexible when it is new by simply making it from the compounds used in the manufacture of a rigid jar, but vulcanizing it for a shorter length of time or at a lower temperature. Such jars were put into service as many as seven or eight years ago, but their use was discontinued. They were flexible, and almost unbreakable when new, but were more easily affected by the acid than the ordinary rigid jar, and hardened up rapidly with age and from the effect of the acid, to the point where they were more brittle than if they had been vulcanized to the usual degree of hardness in the first place.

With flexible jars, therefore, the problem is to furnish a jar low enough in price to be used in a commercial way that will not become brittle too rapidly with age, and that will not harden so as to make it unserviceable. Whether any given jar meets these requirements is something that can be determined only by actual service for the ordinary life of a battery.

Hard rubber parts as they are now used in automobiles vary greatly in designs and sizes, and it is necessary that the hard rubber manufacturer have an enormous investment in special equipment. Costs could be materially reduced if these parts were standardized. There is already considerable standardization of hard rubber parts as used by railroads, and while in automobile construction standardization could not be carried to the same point, there is no reason why it could not be carried further than at the present time.

DISCUSSION.

R. J. Nightingale, sales manager, Willard Storage Battery Co., Cleveland, Ohio, then said: "We use the test on hard rubber storage battery jars exclusively, not so much to test the quality of the jar as to find the defects in workmanship. It has been our experience that the greater percentage of leaky jars was caused by breakage in transit to us from the jar manufacturers or failure of the jar where the workman had rolled the seams. The high voltage test does find defective seams and breaks, as well as thin spots in the walls of the jars.

WHY WOOD SEPARATORS ARE USED.

"We have been told by the speaker that, because of their cost, storage battery manufacturers do not use rubber separators. This is not a fact. Wood separators are used in preference to wooden and rubber sheets, or all rubber separators, because the cell is of higher internal resistance with the rubber sheet or rubber separators. If we were to construct a starting battery with wooden separators and rubber sheets, it would be necessary for the car manufacturer, in order to maintain the same voltage characteristics at the lower temperatures, to purchase a battery of 50 per cent greater capacity than is the one he now has in which only wooden separators are used."

S. A. E. ELECTRICAL VEHICLE DIVISION CONSIDERS BATTERY-JAR DIMENSIONS.

A meeting of the electric vehicle division was held on February 25 in the offices of the Society of Automobile Engineers, 29 West Thirty-ninth street, New York City. Aside from members of the division and the standards committee staff, there were present representatives of five of the leading storage battery manufacturers.

The chief work of the meeting was in regard to dimensions of storage battery jars, as a preliminary to standardizing dimensions of trays to facilitate the interchange of batteries.

The work of the meeting was tentative, and has not been formally approved by the division. The suggested dimensions were as follows:

Heights, high-rib jars	13 5/8 inches.
low-rib jars	12 7/16 inches.
Width	6 1/8 inches.
Thickness of walls	1/8 inch.

No conclusion was reached as to the length, which is variable, depending upon the number and thickness of plates. This problem was discussed at length, and plans were formulated for a tabulation of present practice to be submitted in an attempt to arrive at a reasonable list of standard lengths. This tabulation has now been prepared by a member of the division. It shows forty-five variations in the length between 2 and 8½ inches. It is suggested that the list be reduced to 27 lengths with 2¾-inch sediment space, and to 15 lengths with 1¾-inch sediment space.

The division is thus making real progress toward a standard which promises to be of great value to the electric vehicle industry.

Another matter before the division is a revision of the present standards for charging receptacles consisting in a lengthening of the sleeve and insulating members.

S. A. E. ADOPTS STANDARDS RELATING TO RUBBER.

At a meeting of the Society of Automobile Engineers held in New York City, January 5-6, recommendations for new and revised standards were made. Those on insulated wire and cable, rubber hose and clamps, industrial truck tires and solid tire diameters were published in detail in THE INDIA RUBBER WORLD, February 1, 1916. These recommendations have now been adopted in their entirety by the letter ballot of the voting members, which was closed on March 6.

A PILLOW VENTILATOR.

A pillow full of light, fresh feathers affords an exceedingly comfortable head-rest, but the feathers are apt to become heavy and matted owing to lack of ventilation. A device designed to afford the necessary inlet of air consists of a small spool-like ventilator made of rubber, with holes at each end. In use several of these are sewed in each end of the pillow ticking. [The H. O. Canfield Co., Bridgeport, Connecticut.]

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

Foreign Import Duties on Boots and Shoes.

THE following table, corrected to April 1, 1916, shows the foreign import duties on rubber boots and shoes of all descriptions, imported into the various countries from the United States.

Owing to the frequency of tariff changes the figures and information given in this table should be periodically verified. It is also advised that small trial shipments be made in order to test the rates prior to sending more extensive shipments.

In the first column is given the country, while the next column contains the articles with notes regarding surtaxes, basis of rates, etc. The third column specifies whether the weight is to be taken as gross or net and the last column gives the ad valorem duty and the rate of specific duty in United States currency.

Countries.	Articles and Remarks.	Weight.	Duty (U. S. Currency).
EUROPE:			
Austria-Hungary	Shoemakers' wares, with textile goods, per 100 pounds	Net	$1.23
Belgium	Manufactures of india rubber, ad valorem	Net	10%
Bulgaria	Ordinary rubber boots and shoes (galoshes), per 100 pounds (includes 20 per cent surtax)	Net	$10.53
	Other rubber boots and shoes, per 100 pounds (includes 20 per cent surtax)	Net	$21.06
Denmark	Rubber boots and shoes, with textiles, per 100 pounds—including inner packing	.....	$6.09
France	Rubber footwear lined with felt, wool or any partly woolen cloth, per 100 pounds	Net	$13.13
	Rubber footwear lined with cotton, hemp or flax cloth, per 100 pounds	Net	$10.51
	Footwear with soles of rubber, per pair	.....	$0.14
Germany	Footwear, with or without rubber soles—Unvarnished, per 100 pounds	Net	$7.57
	Varnished, per 100 pounds	Net	$10.82
Great Britain	Manufactures of rubber	.....	Free
Greece	Galoshes of rubber, per 100 pounds	Net	$59.50
Italy	Rubber footwear, lined or trimmed with stuffs, per 100 pairs	Net	$24.13
	Other rubber footwear, per 100 pounds	Net	$4.39
Netherlands	Rubber footwear, ad valorem	Net	5%
Norway	Rubber footwear, per 100 pounds	Net	$12.18
Portugal	Rubber footwear, per 100 pounds	Net	$20.73
Roumania	Rubber footwear, per 100 pounds	.....	$10.53
Russia	Rubber footwear, per 100 pounds	.....	$26.35
Servia	Rubber footwear, per 100 pounds	Net	$12.28
Spain	Rubber footwear, per 100 pounds	.....	$26.32
Sweden	Rubber footwear, per 100 pounds	Net	$12.18
Switzerland	Rubber footwear, per 100 pounds	Gross	$26.32
Turkey	Articles of india rubber and gutta percha, ad valorem	.....	30%
NORTH AMERICA:			
Canada and Nova Scotia	Rubber boots and shoes, ad valorem	.....	32½%
	Boots, shoes, slippers, tennis shoes and insoles of any material not specified, ad valorem. Imports of articles invoiced at prices less than the market value in the country from which exported, are liable to a "dumping" duty of 5 per cent if such articles are also made in Canada.	.....	37½%
Newfoundland	Footwear and all manufactures in part or in whole of india rubber or gutta percha, ad valorem, including 10 per cent surtax	.....	44%
SOUTH AMERICA:			
Argentine	Rubber footwear—includes surtax of 2%—duty based on valuation of $54.79 per 100 pounds	Gross	40.8%
	Footwear of cloth and rubber, whose sole measures 25 centimeters (9.84 inches) or less, duty based on valuation of $3.00 per dozen, includes surtax of 2 per cent	.....	40.8%
	Same footwear, larger sizes, duty based on valuation of $7.00 per dozen, includes surtax of 2 per cent.	.....	40.8%
Bolivia	Rubber footwear for men, surtax of 15 per cent is included, based on valuation of $36.00 per dozen pairs.	.....	46.75%
	Rubber footwear for women and children: Overshoes, rubbers, boots, lined or not, including surtax of 15 per cent, based on valuation of $1.55 per pound	.....	46%
	Footwear for women and children with exterior lining with or without interior lining, including surtax of 15 per cent, based on valuation of $2.27 per pound.	.....	46%
Brazil	Rubber footwear—based on value of milreis as $0.245—per 100 pounds	.....	$5.18
	Rubber goods, combined with tissues of cotton, wool or linen, based on value of milreis as $0.245 per 100 pounds	.....	$12.07
Chile	Footwear of any material, for sports, based on valuation of $3.63 per pound.	.....	40%
	Shoes or overshoes, top boots, boots or tips of rubber, with or without interior lining or exterior part of wool or other material, finished or not, for the rain—based on valuation of $1.815 per pound	.....	30%
Ecuador	Rubber footwear, including surtax of 125.5 per cent, per 100 pounds	Net	$29.83
Paraguay	Rubber footwear, based on valuation of $54.79 per 100 pounds including weight of container	Gross	55%
	Other footwear (same as for Argentina)	.....	55%
Peru	Rubber footwear, including weight of inner packing; at ports of Callao, Salaverry, Paita and Pisco, surtax of 10 per cent	Gross	$31.90
	At other ports—surtax of 8 per cent	Gross	$31.32
Uruguay	Rubber footwear, based on valuation of $5.17 per dozen pairs—surtax of 14 per cent included	.....	54.7%
Venezuela	Rubber footwear, including surtax of 56.55 per cent	Gross	$34.30
ASIA:			
China	Rubber boots, per dozen pairs	Net	$4.88
	Rubber shoes, per dozen pairs	Net	$1.22
Japan	Rubber boots, per 100 pounds	Net	$18.82
	Rubber shoes, per 100 pounds	Net	$21.79
	Rubber over-shoes, per 100 pounds	Net	$19.43
OCEANIA:			
Australia	Galoshes, rubber sand boots and shoes and plimsolls, ad valorem	.....	30%
	Rubber gum and wading boots, ad valorem	.....	10%
New Zealand	Rubber footwear, ad valorem	.....	33⅓%
AFRICA:			
South Africa	Rubber footwear, ad valorem	.....	20%
	With a minimum per pair of—		
	Men's	.....	$0.18
	Women's	.....	$0.12
	Children	.....	$0.06

RUBBER SOLES AND HEELS IN THE BRITISH SHOE INDUSTRY.

RECENTLY quite a number of samples of rubber soles, heels, tips, etc., have been brought before my notice from different manufacturers for inspection. The majority of these rubber soles and heels are of the cheap grades for use in the manufacture of cheap footwear. The majority of heels used in making cheap footwear are of the "cushion type," which has a small piece of leather, cut the same shape as the cushion, but smaller, attached inside the rim or edge of the cushion.

The following data gives some idea of the quality of the heels, soles and studs used in the cheap footwear factories.

No. 1 is for red seat studs about ½ inch in height by ¾ inch in diameter.

	Per cent.
Old door mats, pram tyres, gas pipes	64
Raw rubber	4
Codd rings	2
Sulphur	5
Preparation	10
Whiting	3
Red substitute	3
Red oxide	5
Red Vulcanine	4
	100

No. 2 is that of a grey mixing used in heels:

30 parts prams and mats, etc.
½ part raw rubber.
2 parts sulphur.
5 parts preparation.
1 part white substitute.
2½ parts whiting.

No 3 is that of a mixing without any new rubber at all:

30 parts prams and mats.
2 parts sulphur.
5 parts preparation.
2½ parts whiting.
1 part white substitute.

No. 4 was also a grey mixing used for cushion heels.

30 parts prams and mats.
½ part raw rubber.
½ part golf ball shells.
2½ parts sulphur.
5 parts preparation.
3½ parts whiting.
1 part white substitute.

No. 5 was found to be the best of a series of poor samples of rubber soles, and consisted of a grey mixing as follows:

15 parts prams and mats.
1½ parts raw rubber.
½ part golf ball shells.
2 parts sulphur.
3½ parts preparation.
2 parts whiting.
½ part white substitute.

The reader will no doubt have come to the conclusion by the time he has perused these mixings that the shoe trade can be catered for by a low grade of rubber commodities indeed. The mixings were prepared by grinding the old door mats, perambulator tires, etc., and passing the resulting mass through a fine riddle, and then mixing with an equal weight of tar. These mixings gave constant trouble when they were applied to the shoe, as they were very crumbly, and when the operator at the stitching machine tried to sew the heel or sole to the boot the groove made by the rubber manufacturer in the mold all broke out when the needle passed through.

Shoe manufacturers, of course, cannot expect to get superior quality goods at the price they pay.

[The foregoing contributed to "The India Rubber Journal," by Fred Ashworth, a well-known English analyst and consulting chemist, is interesting as throwing a side light on one of the old-time prejudices of rubber manufacturers, in favor of ground vulcanized scrap in the place of reclaimed scrap. It can be used, of course, and if a binder like tar is added, it may be sheeted and molded, but it would be a better product if the old pram tires, codd rings, etc., were put through an adequate reclaiming process before use.—Editor.]

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered; nevertheless, they are of interest, not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

[161.] A correspondent wishes to know where he can purchase white castor oil substitute and black Russian substitute.

[162.] Prices and samples of "Vulcoleine" have been requested.

[163.] Addresses of concerns making apparatus for the condensation of naphtha vapors are requested.

[164.] An export inquiry for 2,200 pounds of commercial gutta percha tissue, such as used by tailors, has been received.

[165.] An inquiry comes from Holland for machinery for making imitation rubber tiling.

[166.] A manufacturer wants to know where he can secure rubberized mummy silk.

[167.] Names of American manufacturers of gutta percha tissue are desired.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

An East African firm desires to receive catalogs, price lists and full information from American manufacturers of rubber-type printing sets. Report No. 20,553.

Communication with American manufacturers of rubber shoes and arctics is desired by a firm in Norway. Report No. 20,640.

An Italian concern would like to be placed in touch with American manufacturers of erasers of all kinds. Report No. 20,658.

An inquirer in Norway desires to be placed in touch with American manufacturers of brown, blue and black waterproof cloth for raincoats. Report No. 20,728.

A Swiss firm wishes to communicate with American manufacturers of hygienic rubber goods. Report No. 20,730.

Representation is desired in Central America for American manufacturers of suspenders, garters, raincoats, rubber overshoes and other articles. Report No. 20,772.

An applicant in Spain wishes to receive catalogs and full information from American manufacturers of rubber goods. Report No. 20,774.

A Norwegian import firm would like to be placed in touch with American manufacturers of rubbers and arctics. This firm is prepared to give an immediate order for from 100,000 to 200,000 pairs and desires the agency for the whole of Norway. Report No. 20,831.

Quotations are desired by a Swiss firm from American manufacturers of rubber gloves for acid, electrical and medical purposes, rubber-lined canvas hose, high-pressure hose for pneumatic tools, vacuum-brake hose, garden and steam hose, gas tubing, beer tubing, rubber mattings, fishing trousers and stockings, galoshes and rubber boots. Report No. 20,851.

"KANTLEEK" SEAMLESS WATER BOTTLE.

A hot water bottle is a source of comfort and healing in many human ailments, and a corresponding source of discomfort and distress if it leaks. The cemented seams of the usual type of water bottle are apt in time to open up or split, with a consequent leakage that, however small, renders them unfit for use.

As will be seen in the accompanying illustration, the "Kantleek" seamless water bottle is molded in practically one piece of rubber. The rubber is claimed to be of exceptional quality, and the bag is guaranteed for two years. [The Seamless Rubber Co., New Haven, Connecticut.]

What the Rubber Chemists Are Doing.

A SERIES of researches on the synthesis, structure and vulcanization of caoutchouc has been carried out by I. I. Ostromyslenski. Abstracts follow from the "Journal of the Society of Chemical Industry" (March 31):

NEW METHOD OF COLD VULCANIZATION.

A mixture of a primary or secondary aliphatic amine with a metallic oxide either accelerates vulcanization of natural and synthetic caoutchoucs or considerably lowers the temperature of vulcanization. In the presence of such mixtures, vulcanization takes place at the ordinary temperature. The process is especially rapid with chemically pure caoutchouc obtained synthetically. In the air or ordinary molds the vulcanization occupies from a few weeks up to three months, according to the purity of the original caoutchouc. With natural caoutchoucs the vulcanization requires from two to six months at the ordinary temperature.

Vulcanization by means of trinitrobenzene or benzoyl peroxide also takes place at ordinary temperature, no special catalyst being necessary. Oxides of zinc, magnesium, and particularly lead accelerate the action when the nitro-compound is used, but these oxides retard cold vulcanization by benzoyl peroxide and also diminish the value of the vulcanized material. When trinitrobenzene is used, time is saved by preliminary heating of the mixture at 122 to 140 degrees F., or by preparing it with hot rolls. Rolling with benzoyl peroxide must be carried out at the ordinary temperature, otherwise a sticky mass results. Cautious heating of the mixed mass at 86 to 176 degrees F., for 10 to 40 seconds is also necessary in this case, but access of air must be avoided.

ACTION OF AMINES AND METALLIC OXIDES ON THE VULCANIZATION OF CAOUTCHOUC.

In a mixture of caoutchouc, sulphur, amine and metallic oxide, the sulphur and the amine first react with formation of the corresponding thiozonide. This reaction proceeds only in the presence of a catalyst such as an oxide. The unstable thiozonide then transmits its sulphur to the caoutchouc, the amine being regenerated, or the aminic residue, under the influence of the oxide, uniting with a fresh portion of sulphur to give thiozonide. The process is one of double catalysis. The metallic oxide catalyses the formation of the thiozonide of the amine, which in turn accelerates the formation of the caoutchouc thiozonide and so catalyses the vulcanization. Only primary and secondary amines give thiozonides and these are also the only amines which catalyse the vulcanization of caoutchouc. Thiozonides of aromatic amines are relatively stable compounds, incapable of functioning as sulphur carriers. An explanation is thus afforded of the observation that aromatic amines have practically no catalytic action on the vulcanization of caoutchouc.

From Bernstein's observation that the ordinary vulcanization of caoutchouc proceeds at the ordinary temperature under the action of ultra-violet light, it is concluded that, in the absence of air, this light activates sulphur by converting it into thiozone. The vulcanization is then effected partly by the latter and partly by the ozone formed simultaneously. Thiozone is also formed when ordinary sulphur is dissolved in a primary or secondary aliphatic amine, such as piperidine with a side chain, and the solution either heated for 20 to 50 minutes with lead oxide in a reflux apparatus on a water bath, or left at the room temperature.

VULCANIZATION OF CAOUTCHOUC BY HALOGEN COMPOUNDS.

In the formation of vulcanite-like substances by the action of bromine, iodine or iodine bromide on caoutchouc, the first phase of the change consists in the formation of the caoutchouc halogenide. The unchanged caoutchouc then absorbs this new compound or forms a swollen mass with it. This process may also be carried out by treatment of the caoutchouc with its halogenide. The latter acts either freshly prepared or old. All three halogenides of either natural or synthetic caoutchouc may be employed. Caouprene chloride or bromide exert a similar action on caoutchouc. The products obtained from the chloride are especially valuable because of their great stability and relatively low elastic point, and are easily obtained chemically pure. The amount of caoutchouc used need not exceed 7 to 10 parts per 100 parts of caouprene chloride. Similar vulcanization is effected by the action of the hydrochloride of natural caoutchouc, but not by that of aluminum chloride. The products obtained by the above methods have the black color of ordinary ebonite, are electrical non-conductors, may be scratched with the nail, keep well even in moist air, and take a high polish.

NATURAL GAS AND SYNTHETIC RUBBER.

In recent investigations by Singer, natural gas below the freezing point was subjected to successive pressures, according to "Le Caoutchouc & la Gutta-Percha." The first compression, of 3½ atmospheres, yielded liquids having a density of 0.6935 to 0.6720; and those of the second compression, of 24 atmospheres, showed a specific weight of 0.6365 to 0.6160.

The first part contained 30 per cent of pentane, 30 per cent of hexane and 7 per cent of butane. The second part was composed of ethane, propane and hexane, and appeared to be similar to the gas oil studied by Colson.

These products may serve as low cost material for transformation into isoprene or butadiene.

METHODS OF ANALYSIS.

ANALYSIS OF VULCANIZED RUBBER GOODS.

THE following scheme for analysis is reported by J. A. S. Morrison of Glastonbury, England:

The usual estimations are: rubber resins, free sulphur, mineral matter, vulcanized rubber and rubber substitutes.

RUBBER RESINS.—Rasp the sample into small pieces; weigh out 4 grams and extract with acetone in a Soxhlet extractor for two days. Dry the extract at 212 degrees F. and weigh. This extract contains the rubber resins and free sulphur, the latter being estimated in the extract as described later. The total extract minus the free sulphur gives the rubber resins. Keep the residue from the extraction in order to determine the rubber substitutes.

MINERAL MATTER.—To determine the mineral matter, 1 or 2 grams of the sample are boiled with 50 cc. of nitrobenzene in a fat flask with air reflux. It is then cooled and washed into a 300 cc. tall beaker with a mixture of 2 vols. sulphuric ether and 1 vol. ethyl alcohol. Dilute to about 250 cc. with this mixture, stir and stand over night to settle. Viscous deposits are due to insufficient ether, and more should be added if these occur. Filter the insoluble matter on a tared filter, dry and weigh. This gives organic matter insoluble in nitrobenzene plus mineral matter.

Wash the tared filter with warm dilute hydrochloric acid. Wash out acid with water, dry and weigh. Finally ash the paper and residue and weigh ash. Ash plus loss due to hydrochloric acid washing gives total mineral matter. The extraction with hydrochloric acid is carried out in order to extract carbonates as such.

The difference between the total nitrobenzene residue on the tared filter and the total mineral matter gives the organic matter insoluble in nitrobenzene. Carbon if used as a filling will be included in this figure.

FREE SULPHUR.—Take acetone extract (rubber resins) in a fat flask, moisten with water and cautiously add 25 cc. fuming nitric acid, cooling the flask in ice. Then gently warm and finally digest on steam bath, using a funnel as cover. When action is complete wash into a porcelain dish with a few cc. of fuming nitric acid and evaporate off all the acid. All the sulphur is now converted into sulphuric acid. Intimately mix the mass with 5 grams of a mixture of 3 parts sodium carbonate and 2 parts potassium nitrate; moisten slightly with water and mix well. Cover with a large dish and heat over a low flame till white. Cool and take up with concentrated hydrochloric acid, evaporate to dryness twice to precipitate silica and then finally dissolve in dilute hydrochloric acid, filter and precipitate as barium sulphate. Calculate to sulphur. This gives the figure for free sulphur.

RUBBER SUBSTITUTES (OXIDIZED OIL, ETC.).—The residue from the acetone extraction in the determination of rubber resins is digested with 100 cc. approximately half normal alcoholic potash for 4 hours at 140 to 158 degrees F. Pour off through a filter and digest residue twice with warm alcohol. Mix filtrate and alcoholic washings and evaporate off nearly all the alcohol. Take up the residue in a little cold water, transfer to a separating funnel, acidify and remove the fatty acids with ether. Ether extract is then taken to dryness and weighed. This gives fatty acids of oxidized oils, and is taken as the percentage of rubber substitutes.

VULCANIZED RUBBER.—This is obtained by subtracting the sum of the other determinations from 100.

TOTAL SULPHUR.—The method is the same as that described under free sulphur only one uses the original rasped rubber. The difference between total and free sulphur gives combined sulphur, but as this is included in vulcanized rubber, it is seldom separately expressed.

FREE SULPHUR IN RUBBER INSULATION.

The method for determining free sulphur in vulcanized rubber insulation as developed by Emile Baldeschwieler is as follows:

The weight of the finely divided sample varies, but generally 2 grams is sufficient. It is extracted for 8 to 10 hours in a Soxhlet apparatus with acetone at 131 degrees F. The apparatus is then disconnected, the excess of solvent evaporated, and the flask dried at 131 to 140 degrees F. Fuming nitric acid to the amount of 60 cc. is then added to the residue in the flask, which is covered with a watch glass, and contents boiled gently until most of the red fumes have been expelled.

The flask is then uncovered and a small pinch of potassium chlorate added to the boiling liquid. Continue the addition of small amounts of potassium chlorate until the liquid is entirely clear. When the greenish color has disappeared, remove the flame and cool the flask in ice water. If properly conducted the operations will yield a clear liquid with white flakes or a lump of paraffin floating on top.

This is separated by filtration and the filtrate, evaporated nearly to dryness, is taken up with hydrochloric acid. The operation is repeated several times to drive off the nitric acid. Dissolve the residue in water, add 1cc. dilute hydrochloric acid and filter into a 500 cc. beaker. Make up to 400 cc. with water, heat to boiling and add, drop by drop, a slight excess of a 10 per cent solution of barium chloride. Filter and weigh as barium sulphate.

DIRECT DETERMINATION OF RUBBER IN VULCANIZED RUBBER GOODS.

A combustion method for the direct determination of rubber in vulcanized rubber goods has been developed by Robert W. Belfit. It is simple, quick and accurate for high grade compounds and preferable to those direct methods which depend upon the formation of compounds, the exact formulæ of which are not constant or controllable.

The author states that his method is at present restricted to positively high grade stocks, which do not contain lampblack, reclaimed rubber or rubber substitutes. The method gives the percentage of rubber too high in the presence of ground leather, egg albumen or other organic compounds insoluble in acetone, water and dilute hydrochloric acid.

In detail the procedure is as follows:

The sample is ground so that it will all pass through a 20-mesh sieve while but 20 per cent passes through a 40-mesh sieve. Then, 2 grams are extracted in a weighed tube for 5 hours with acetone kept continually at the boiling point. The tube containing the residue is inserted in an oven, kept at 212 degrees F., and a current of dry carbon dioxide is passed through the tube in order to aid rapid drying and prevent oxidation. The dried sample is weighed, and the percentage loss in weight calculated. About one-half of this extracted sample is weighed into a 250 cc. Erlenmeyer flask, and is cautiously boiled for 30 minutes with 150 cc. of hydrochloric acid (1 to 5 by volume). In this process all carbonates are driven off.

The liquid is decanted through an alundum crucible and the residue is washed three times by decantation with water at about 140 degrees F., then washed ten more times with warm water. The residue is now placed in a tube and dried in a stream of dry carbon dioxide at 212 degrees F. for two to four hours. The tube is then removed and cooled in a desiccator.

This dry residue is next transferred to a weighing tube, from which 0.3-gram samples are weighed for combustion. The combustion is carried out in approximately the same manner as for any organic compound, except that no reduced copper spiral is used, as the water and nitrogen oxides are absorbed in a concentrated solution of potassium dichromate in sulphuric acid. A vessel of small volume is necessary for this solution, or otherwise it is almost impossible to displace all of the carbon dioxide after the sample has been completely burned. Beyond this tube is placed a U-tube containing zinc dust to absorb all possible acid gases other than carbon dioxide. The potassium hydroxide absorption bulb is next and last in the train. The rubber substance is burned in a stream of oxygen, and the potash bulb is always weighed when full of oxygen.

This method on pure, fine Para gum gave 96.16 and 96.57 per cent.

The value 0.96 is taken as the figure by which the weight of caoutchouc should be divided in order to obtainn the weight of the rubber from which it came.

HASTENING EVAPORATION.

A piece of block tin tubing is made into a coil, which is put into a water bath, and to one end is attached a rubber tube connecting to a source of air. To the other end is attached a tubing connected to a right-angle glass tube, and which is passed through a stopper held in a clamp on a ring stand. By raising and lowering the clamp the distance of the air outlet from the surface of filtrate can be regulated. B. Freeman, of Clemson College, South Carolina, states that the heated air in the coil will hasten evaporation 50 per cent.

SCHOLARSHIP IN CHEMICAL ENGINEERING.

The Chemists' Club of New York City announces the establishment of a scholarship fund, the income from which, approximately $500 per year, is to be devoted to assisting financially deserving young men to obtain education in the field of industrial chemistry or chemical engineering. This scholarship has been endowed by Dr. Victor G. Bloede, a prominent manufacturing chemist of Baltimore. Its benefits will be open to properly qualified applicants without restriction as to residence, and may be effective at any institution in the United States, which may be designated or approved by the Chemists' Club.

All inquiries should be addressed to the Bloede scholarship committee of the Chemists' Club, 50 East 41st street, New York City. Applications for the academic year 1916-1917 should be in the hands of the committee on or before June 1, 1916.

CHEMICAL TREATMENT OF RUBBER.

THE UNITED STATES.

DEVULCANIZING RUBBER. No. 1,178,483. Samuel E. Allen, assignor to the Empire Rubber Co.—The process of devulcanizing rubber by subjecting it to a bath having a boiling point above 392 degrees F., and containing oil derived by distillation from pine wood.

PRODUCING CAOUTCHOUC SUBSTANCES. No. 1,178,721. Fritz Hofmann; Konrad Delbruck and Kurt Meisenburg, assignors to Farbenfabriken Vorm Friedr. Bayer & Co., Elberfeld, Germany.—The process of producing a composite caoutchouc substance which comprises mixing a hydrocarbon of the butadiene series with about an equal amount of caoutchouc and polymerizing the hydrocarbon in such mixture to give a composite caoutchouc substance.

UNITED KINGDOM.

ARTIFICIAL LEATHER. No. 100,038 (1916). N. G. Scheuer, Copenhagen.—Artificial leather is made by impregnating linen duck with linseed oil or a varnish to which a little siccatif and Vienna red have been added, drying and sticking the sheets together with a mixture of 4 kilos heated wood tar pitch, 2 kilos india rubber dissolved in benzene or the like, 4 kilos Vienna red mixed to thick consistency with French turpentine, and 2 kilos of powdered cork. The compound sheet is finally passed through pressure rollers.

CANADA.

VULCANIZING PROCESS. No. 167,203. Paul I. Murrill, assignor to the Canadian Consolidated Rubber Co., Limited. Same as United States patent No. 1,166,777. THE INDIA RUBBER WORLD, February, 1916.

VULCANIZATION ACCELERATOR. No. 167,204. Paul I. Murrill, assignor to the Canadian Consolidated Rubber Co., Limited. Bone oil is added as an accelerator of the vulcanizing agent.

THE FRENCH REPUBLIC.

RECLAIMING RUBBER FROM TIRE FABRICS. No. 478,280. C. De Villers. The process consists in treating the rubber-coated waste fabric with boiling hot tetrachloride of ethane in two stages. The free sulphur is removed by a brief treatment, the solution of the rubber is accomplished by a second extraction with fresh solvent.

SPONGY RUBBER. No. 478,369. P. Schidrowitz and H. A. Goldsborough. Coagulating rubber latex under conditions producing a porous or spongy coagulum and fixing the pores by vulcanization. (THE INDIA RUBBER WORLD, July, 1915.)

THE GERMAN EMPIRE.

WATERPROOF FABRICS. No. 285,138 (1912). The material to be waterproofed is treated with hydrocarbons yielding synthetic gums by known process of polymerization. The result is a more uniform impregnation with gum than is possible with the use of gum solutions.

"BALATA" FROM NORTHERN NIGERIA.

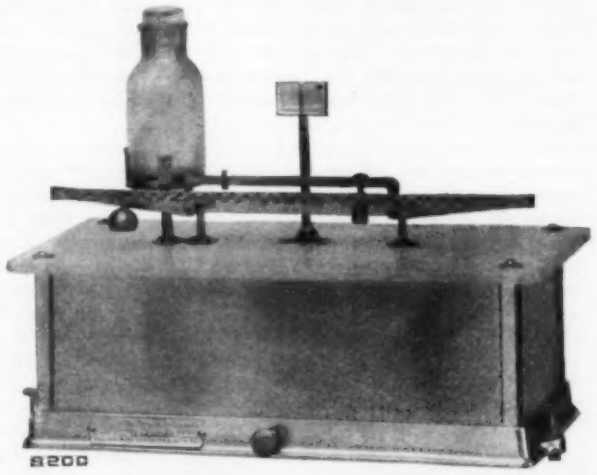
The Imperial Institute has examined a sample of "balata" rubber from northern Nigeria. It contained considerable moisture and vegetable impurities; was white to red in color; tenacious; only slightly elastic and very sticky. The sample lost 26 per cent impurities by washing. Analysis of the residue showed 49.2 per cent caoutchouc, 47.4 per cent resin, 2.4 per cent protein and 0.7 per cent ash.

The caoutchouc when isolated was almost black and showed inferior physical properties. The "balata" rubber of northern Nigeria is probably derived from *Ficus vogelii*, the preceding data being in accord with the analyses, made by the Imperial Institute, of samples of the product obtained from this tree in Gambia and the Gold Coast.

LABORATORY APPARATUS.

LIQUID SPECIFIC GRAVITY BALANCE.

A SPECIAL torsion balance has been perfected, designed especially for readily determining the specific gravities of liquids. The results are obtained direct from the reading of the beam without the use of loose weights or calculations. The scale



is adapted for specific gravities from 0.7000 to 1.4000, and is accurate to the fourth decimal place.

The operation of the scale is extremely simple. The bottle is filled with the liquid, wiped thoroughly clean on the outside and placed upon the scale. Balance is secured by means of the slide weights, and the result read from the beam. [Christian Becker, New York City.]

BURETTE ATTACHMENT.

A simple attachment to a stop-cock burette enables the operator to control perfectly the flow of reagent during titration. The discharge may be regulated from a series of drops to a fraction of a drop, as may be required at the end of reaction, when too much may spoil the work of hours.

The device does not interfere with the ordinary use of the burette. It consists of an arm attachable to the stop-cock and an adjustable stop arranged around the burette. [E. P. Curtis, New York City.]

ANOTHER SYNTHETIC RUBBER SCHEME.

A writ of attachment against the property of Knut C. Widdeen, of Brooklyn, New York, has been issued to recover $31,200 advanced to him by the backers of his alleged synthetic rubber scheme. It is alleged that Widdeen claimed he had a process for making synthetic rubber at a cost of 15 cents a pound, and that a demonstration was given in Brooklyn, where a big vat was shown containing some sticky substance which Widdeen described as rubber made by his process. The proposition was to form a company to be called the Northern Rubber Corporation, with a capital of $100,000, later to be increased, Widdeen claiming that it would be easy to make 10,000,000 pounds of rubber per year, and offering the plaintiffs 51 per cent of the capital stock for $31,200. The plaintiffs, Kuno B. Heberlein and Franz Rosenberg, put up the money, and finding the business lagging, hunted for Widdeen only to discover that he had gone south and had left no word as to the date of his return.

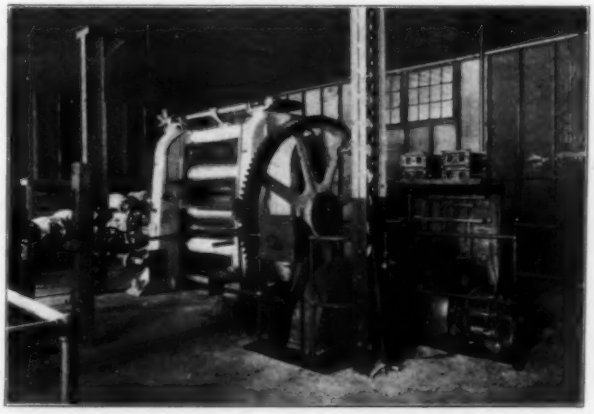
New Machines and Appliances.

AUTOMATIC ELECTRICAL CONTROL FOR CALENDERS.

THE illustration shows the installation of an up-to-date automatic electrical calender control equipment, where the calender is used for various classes of work, such as frictioning, skim coating and sheeting tire stock. Each of the above operations is performed at different speeds, and in order to maintain a uniform quality of material it is necessary that the speeds of the rolls during the various processes should be constant.

Therefore a direct current adjustable speed motor is preferable for a calender drive. This type of control is fully automatic. It consists of three parts, the main panel, on which is mounted the operating contactors; the master panel, on which is mounted the field rheostat for speed control with 70 points to insure close speed adjustment, and a push button station, mounted on the side of the calender, from which the control is operated.

From this station the motor may be started, stopped, or slowed down without stopping for threading in. After once



setting the master controller for any desired speed, the operator can either slow down to the threading speed or stop and then start up again and return to the same speed without readjustment of the control.

The master field rheostat is provided with a dial stamped in yards per minute, so that the operator always knows the yardage at which he is running. The equipment also provides dynamic braking for quick stopping. The control illustrated is used with a 90-horse-power, 300 to 900 revolutions per minute, 230-volt motor driving a 24 x 66-inch 3-roll Farrell calender. [General Electric Co., Schenectady, New York.]

STANDARD CLOTH MEASURER.

The extremely simple and low cost cloth measuring machine shown in the illustration can be used to measure almost any fabric or rubber-covered goods. It is not designed for handling a large and continuous output, but is well adapted for inventory taking or where small yardage is measured daily or large yardage occasionally.

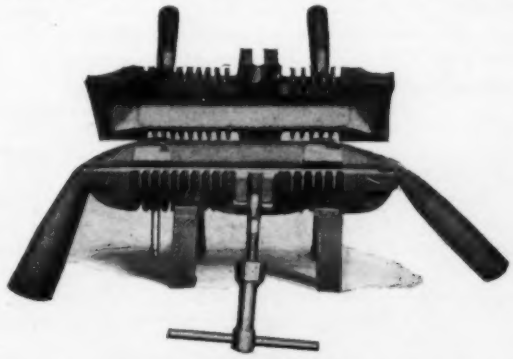
The cloth is simply pulled through by hand and, as the measuring wheel is turned, the measurement of the cloth is registered on the dial. The entire measuring mechanism is mounted on a hinged plate so the cloth can be easily introduced. An automatic lock is provided to stop the measuring dial when the cloth leaves the wheel. The pointer is set to zero by operating the thumb screw in the center of the dial.

The measuring wheel is three-quarters of a yard in circumference and rests directly upon the cloth, while it is prevented from slipping by minute pins in the rim. Should these pins

result in injury to the cloth, the measuring wheel can be covered with felt, leather or plush. [Parks & Woolson Machine Co., Springfield, Vermont.]

A NEW INNER TUBE SPLICE VULCANIZER.

The Allen air-cooled vulcanizer is one of the newest devices for curing the joint of inner tubes. It consists of a two-part hinged cylinder cored for steam, and provided with heat radiating flanges. It is supported on standards for convenient operation from a bench or table. There are two handles for opening the vulcanizer, and a swinging bolt operated by a socket wrench for tightening the two halves together. The inside of the cylinder is bored to exact size of the inner tube. The ends, however, are closed and act as clamps, limiting the air to the confined part of the tube. An opening is provided in the lower section of the vulcanizer to accommodate the valve stem. The tube is skived, cemented and placed in the steam-heated cylinder, which is then closed, locked, and the part of the tube within the vulcanizer is inflated against the walls of the cylinder. When the cure is complete the steam is shut off, and after the vul-



canizer cools down, which is greatly facilitated by the heat radiating flanges, the tube is removed from the cylinder. [Allen Machine Co., Erie, Pennsylvania.]

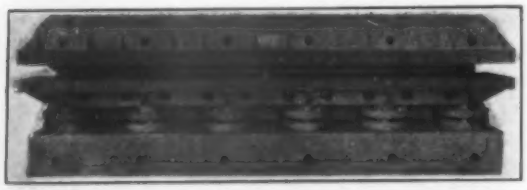
SOUTHWARK 250-TON GOOSE NECK TIRE BEAD PRESS.

A six-cylinder tire bead press of the goose neck type is the subject of the accompanying illustration. It is designed according to the demands of modern tire practice for quality of work and maximum production.

The cast iron housing is heavily built and ribbed to withstand without deflection the full pressure of 250 tons when applied by the powerful rams. The cast steel ram cylinders are rigidly

supported in the base of the housings and the six hydraulic rams operate in perfect unison in raising and lowering the steam platen. This is 24 inches wide and 16 feet long, chambered for steam and attached so that the expansion due to the heat is provided for. The top platen is of the same dimensions, similarly constructed and attached to the upper part of the housing.

While this press is used for forming and curing tire beads,



it is equally serviceable in vulcanizing hose, matting and belting. [Southwark Foundry & Machine Co., Philadelphia, Pennsylvania.]

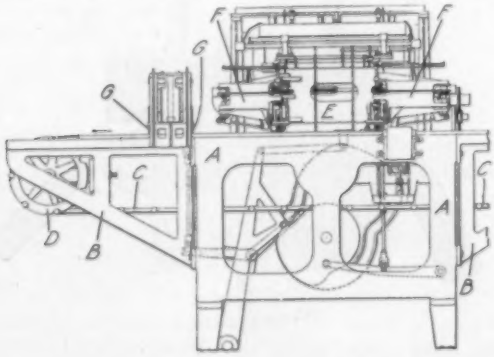
MACHINERY PATENTS.

THE WINKLEY SOLE CUTTING MACHINE.

THE machine illustrated in the drawing is specially designed to automatically cut shoe soles from sheets of rubber stock and to impress thereon the medallions which usually appear near the middle of the sole.

The frame of the machine is designated by *A*, while *B* are the extensions supporting the moving work table *C*, on which the cutting is done. This table is composed of thin, flat plates pivoted together, forming an endless carrier that is driven by the sprocket wheel *D*. The sheets of rubber stock are placed upon the table by the operator, and as they are advanced into position to register with the cutters they are operated upon by pressure rollers which press them uniformly and evenly upon the surface of the table.

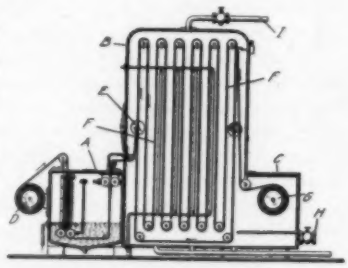
The two cutting mechanisms *F, F*, which are mounted over this table, are driven by independent gearing, cams and levers operated from the main shaft. Each cutting mechanism comprises a form or pattern corresponding in outline to the sole to be cut, a cutter carrying head, and feeding and controlling mechanism which causes the cutter to travel in a path corre-



sponding to the outline of the pattern. Each cutter is operated and controlled independently of the other, and as each cutter finishes cutting a sole its operating and controlling mechanism is thrown out of operation. When both cutters have finished their operation the heads are raised to disengage the cutters from the stock, and mechanism for moving forward the table to present a new portion of the stock to the cutters is thrown into action. As the shifting movement of the table is completed the medallion impressing mechanism *G, G*, is operated to impress one or more medallions upon the cut soles. [Erastus E. Winkley, Lynn, Massachusetts. United States patent No. 1,177,577.]

APPARATUS FOR IMPREGNATING TIRE FABRICS.

Kremer's invention relates to a process and mechanical apparatus for impregnating cotton fabrics with rubber or other materials suitable in the preparation of fabrics for use in the manufacture of tire casings. A vertical section of the apparatus is shown in the illustration in which *A* is the solution tank, *B* the drying chamber and *C* the compartment where the saturated fabric is wound up on a roller.

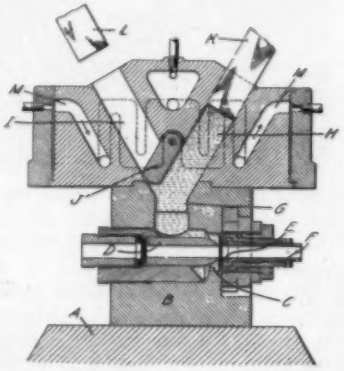


In operation the fabric is fed from the roll *D* into the rubber solution, where the air is removed by a pair of rollers that also force the solution into the interstices of the cloth. As it passes out of the tank the excess rubber is removed by another pair of rollers.

The fabric (which is attached to the cross bar *E*) is then drawn through the drying chamber by the endless chain belt *F*, driven by a series of sprocket wheels, and is wound up on the roller *G*. Hot air is introduced to the drying chamber through valve *H*, and circulation is maintained through pipe *I* located at the top of the chamber. The condensed solvent is drawn off through a pipe provided for that purpose at the bottom of the chamber. [F. W. Kremer, Carlstadt, New Jersey. United States patent No. 1,174,995.]

COVERING HOSE WITH LEAD PRIOR TO VULCANIZING.

This machine is primarily adapted for forming a tube of lead around rubber hose to perform the services of a mold during the process of vulcanization. It may also be used with other machines for making metallic tubes, without regard to whether such tubing is formed around rubber hose or a tube of other character.



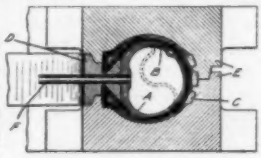
Referring to the illustration, *A* is the base of the machine that supports the block *B*, provided with a die chamber *C* in which the die *D* is supported by a threaded sleeve. The forward end of this die cooperates with the female die E supported in the die carrier *F*.

The molten metal is discharged into the passage *G* from the supply chambers *H* and *I*. The block *J* swings on a pivot and automatically closes the chamber *I* when pressure is applied by the plunger *K* to the molten metal in chamber *H*. When pressure is applied to the metal in chamber *I*, the opposite chamber is closed by the swinging block *J* and the metal from chamber *I* is discharged into the passage *G*. From here the metal is forced through the dies *D* and *E* which encase the hose in a tube of lead as it passes through the openings provided for it in the dies.

In order to partially cool the molten metal and head block, the latter is provided with angular chambers *M M*, through which water is caused to flow. [C. D. Garretson, Wilmington, Delaware, assignor to Electric Hose & Rubber Co., Wilmington, Delaware. United States patent No. 1,177,097.

PNEUMATIC TIRE VULCANIZING BAG.

This invention relates to annular fluid pressure bags which are employed in vulcanizing certain types of pneumatic tire casings, such as cord tires, to hold them in an expanded condition while being cured. Referring to the illustration, *A* is an annular inflatable bag made of frictioned fabric, suitably reinforced and thickened at the base or inner wall by extra plies of fabric. The shield *B* is composed of the same materials and is attached by its inner margin to the base of the bag, forming a continuous annular flap. This is prevented from adhering to the bag during vulcanization by dusting the surfaces with talc.



Afterwards the collapsed bag is inserted in the casing *C*, the head ring *D* is applied and the tire placed in the vulcanizing mold *E*. The bag is then inflated by fluid pressure applied through the tube *F*, transmitting uniform pressure through the shield flap to all adjacent parts of the inner tire wall. Thus ridges in the latter are avoided, and at the same time the shield acts as a protector against possible overheating of the vulcanizing bag. [J. J. Johnson, Jr., and J. R. Gammeter, both of Akron, Ohio, assignors to The B. F. Goodrich Co. of New York City. United States patent No. 1,177,112.]

PACKING CUTTER.—Square or round packing can be accurately cut at the desired angle by this machine, producing smooth, perfect fitting ends. [R. A. Landry, Houston Heights, Texas. United States patent No. 1,176,838.]

PNEUMATIC TIRE MOLD.—It is a two-part annular mold with interchangeable tread forming rings and inside and outside rings for aligning the mold parts. Pressure is applied to the interior of the tire by a water inflated bag. [G. E. Batcheller, New York City. United States patent No. 1,175,681.]

BRITISH AND FRENCH PATENTS.

ELASTIC FABRICS. In making fabric for surgical elastic hosiery, rubber threads covered with ordinary cotton thread are arranged in pairs forming the warp, while non-elastic threads are used as the filler, thereby producing an open mesh elastic fabric [A. F. Porter, 12 Aldersgate street, London, England. British patent No. 23,561 (1914).]

AEROPLANE WHEEL AND RIM. The object of this invention is to permit rapid mounting and de-mounting of tires having wired or inextensible beads, yet prevent lateral displacement of the tire when fitted to the rim. [Dunlop Rubber Co., Limited, 14 Regent street, London, and Colin Macbeth, Aston Cross, Birmingham, England. British patent No. 2,638 (1915).]

OVERFLOW TRIMMING MACHINE.—This invention comprises a rotary cutter operating in conjunction with an adjustable table and a lever for holding the material in contact with the cutter. [Edwin Harrison, Brook College, Leyland, Preston, England. British patent No. 5,218 (1915).]

EMBOSSING SHOE CALENDER WITH INTERCHANGEABLE DESIGN SLEEVES.—The embossing roller is removable and is provided with interchangeable sleeves bearing the engraved designs and patterns desired to be impressed on the rubber. [Charles Woollett, 176 Rice Lane, Walton, Liverpool, England. British patent No. 460 (1916).]

EXPANDING VULCANIZING MOLD.—In making linings for pneumatic tires an expansible body of zinc provides for the expansion of the mold parts when heated. [T. Sloper, Southgate Devizes, Wiltshire, England. British patent No. 22,995 (1916).]

METHOD OF MAKING TIRE CASINGS.—The outer covers of pneumatic tires are generally built up with fabrics coated with a rubber solution, and cut bias at an angle of about 45 degrees. The inventor inserts between the superimposed canvas layers a woven fabric cut bias. This fabric is coated and equally elastic in both directions, viz., in the plane of the wheel and in the direction perpendicular to the said plane. Its intended purpose is to provide equal resistance in both directions. [M. Laroche. French patent No. 47,825 (July 25, 1914).]

MACHINE FOR MAKING INLAID OR MOSAIC WORK.—The material which forms the foundation or backing for the inlaid work, is supported by rollers which communicate to it a forward movement. A series of mechanically controlled "die" rollers arranged above the supporting rollers, cuts out the pieces forming the mosaic which are ejected and placed on the foundation to which they are firmly attached, forming the design. [E. T. Fenwick. French patent No. 478,210 (March 31, 1915).]

OTHER MACHINERY PATENTS.

THE UNITED STATES.

1,176,166. Skiving machine. J. H. Reed, assignor of one-half to D. A. Sutherland—both of Lynn, Mass.
1,176,686. Wrapper unwinding machine. T. Midgley, Worthington, Ohio, assignor to Morgan & Wright, Detroit, Mich.
1,176,885. Method and core for building tire casings. W. R. Denman, assignor to Miller Rubber Co.—both of Akron, Ohio.
1,177,197. Tire builder's tool. G. McNeill, assignor to Morgan & Wright—both of Detroit, Mich.
1,177,755. Collapsible core. A. Adamson, Akron, Ohio.
1,177,756. Collapsible core. A. Adamson, Akron, Ohio.
1,177,833. Mold for making rubber heels. J. G. Tufford, assignor to The I. T. S. Rubber Co.—both of Elyria, Ohio.
1,178,908. Feeding device for tubing machines. G. F. Fisher, Plainfield, N. J., assignor to Morgan & Wright, Detroit, Mich.
1,178,974. Tire making machine. P. D. Thropp and J. E. Thropp, and A. de Laski—all of Weehawken, assignors to The de Laski and Thropp Circular Woven Tire Co., Trenton—both in New Jersey.
1,179,033. Method of and apparatus for reinforcing inflatable tire tubes. J. H. Poole, assignor to Reinforced Inner Tube Co.—both of Brockton, Mass.
1,179,077. Machine for forming rubber tubes and the like. E. S. Current, Beach City, Ohio.
1,179,200. Means for splicing inflatable tubes. D. Lowe, East Akron, Ohio.

THE UNITED KINGDOM.

22,490 (1914). Machine for masticating, drying or washing rubber. S. C. Davidson, Sirocco Engineering Works, Belfast.
*23,221 (1914). Making compound fabric. L. A. Subers, Marion building, 1270 West Third street, Cleveland, Ohio.
*23,223 (1914). Making hose or compound fabrics. L. A. Subers, Marion building, 1270 West Third street, Cleveland, Ohio.
*23,224 (1914). Making laminated fabric bands. S. A. Subers, Marion building, 1270 West Third street, Cleveland, Ohio.
23,590 (1914). Molding tires. W. Reid, 8 Albert Drive, Pollokshields, and J. Stungo, 157 St. Vincent street—both in Glasgow.

THE DOMINION OF CANADA.

167,119. Vacuum tubing machine. The Rubber Regenerating Co., Naugatuck, Conn., assignee of R. B. Price, New York City. (See THE INDIA RUBBER WORLD, December, 1915, page 121.)

NEW MANUFACTURING PROCESSES.

PRESSURE CURE.—Rubber articles, hose tubes and the like are subjected to vulcanizing heat and external fluid pressure in a closed chamber, then a cooling liquid is admitted to the chamber while the goods are under pressure. [John M. Bierer, assignor to Boston Woven Hose & Rubber Co., Cambridge, Massachusetts. United States patent No. 1,177,678.]

INNER TUBE MADE OF GUT.—The interior or exterior of the gut is impregnated with rubber or a similar solution which improves its resiliency as well as increasing its impermeability to air. These inner tubes can be made with or without seams, in one piece or in several parts, according to the size desired, and are intended for automobile, motorcycle and bicycle tires. The tube is provided with a valve through which air or any other material can be forced into it. [Wilhelm Pook, Marienthalerstrasse 126. Hamburg, Germany. German patent No. 640,924.]

OTHER PROCESS PATENTS.

THE UNITED STATES.

1,179,374. Hose construction combining an incasing jacket, an inner fluid conveying tube and a reinforcing fabric. R. Many, Oak Park, Ill.

THE UNITED KINGDOM.

23,069 (1914). Tubular fabric for cotton fire hose. W. J. Mellersh-Jackson, 28 Southampton Buildings, London.
*23,222 (1914). Compound fabrics. L. A. Subers, 1270 West Third street, Cleveland, Ohio.
*23,225 (1914). Compound fabrics. L. A. Subers, 1270 West Third street, Cleveland, Ohio.
*23,226 (1914). Compound fabrics. L. A. Subers, 1270 West Third street, Cleveland, Ohio.

THE FRENCH REPUBLIC.

PATENT ISSUED (With Date of Application).

478,251 (July 25, 1914). Construction of a carcass for pneumatic tires. M. Laroche.

THE EDITOR'S BOOK TABLE.

STANDARDIZATION OF AUTOMOBILE TIRE FABRICS. TECHNOlogic Paper No. 68 of the Bureau of Standards, Washington, D. C. By Walter S. Lewis and Charles J. Cleary.

THIS pamphlet records the various steps taken by the authors in the study of the fabrics for the purpose of developing the best methods of testing 17¼-ounce standard tire building fabrics. The chief causes of variations in test results were found to be due to different testing machines, size of test specimen, moisture in fabric at the time of test, method of selecting samples and differences in the fabric. Comparative tests were made to determine which of the several common methods for ascertaining each particular physical property of the fabric would give the most reliable results.

The difference in strength of the same fabric tested upon two different testing machines was often large. In one case it was 40 pounds and the strength of the fabric was about 225 pounds. Several kinds of test specimens prepared for the strength tests were carefully compared. The results indicated that a test specimen one inch wide and 3 inches long is fully as satisfactory as regards accuracy and reliability as any other dimension. The quantity of moisture in the cotton fabric has a marked influence upon the weight and strength. Methods of sampling for strength tests are, also, fully discussed and tables are given showing in detail the results of the various investigations.

THE AUTOMOBILE FUEL SITUATION. BY E. S. FOLJAMBE, Society of Automobile Engineers, New York City. [8vo, 18 pages, paper bound.]

An address on the present gasolene situation given by E. S. Foljambe, managing editor of the Chilton Co., before the Metropolitan Section of the Society of Automobile Engineers at its March 16 meeting, has been published in pamphlet form. He claims that the present high price for gasolene seriously affects the automobile industry, which already shows a falling off in demand for new machines. He quotes from the report of Secretary Lane of the Interior, who gives as the causes for the phenomenal rise in the price of gasolene, increase in consumption and in exports, causing a depletion of stock on hand, and to these are added decreased production of crude oil, rich in gasolene, and the increase in the price of crude oil from which gasolene is made. The United States Bureau of Mines places the value of petroleum wasted at not less than $50,000,000 a year, due largely to evaporation, nearly all of which is preventable. If no new oil fields are discovered, and even if the production of casing-head gasolene from natural gas continues to increase, the author figures that the total supply will be exhausted in 15 years. Alcohol, he deems, offers no relief at present. Benzol may be used—in fact, is used in Europe as a substitute, but sells at present at a higher price than gasolene. Natural gas under pressure has proven practicable for short runs. Kerosene may come into use, but it brings problems. The engines would need to be modified and low-grade fuel carburetors must be devised. Some form of thermostat must be installed. Gasolene would be needed even then to start the engine, and perhaps a mixture of fuels of high and low volatility might be used, a combination valve being provided which would allow any proportion of each in the mixture. Several special carburetors are described and their principal merits mentioned. The suggestions as regards remedies, or measures for relief, are a tax on exports, improvement and general use of more economical distillation processes, the curtailment of waste, the development of crude oil fields, oil-bearing shales and natural gas districts.

PEEPS AT MANY LANDS. SOUTH AMERICA. EDITH A. BROWNE, F.R.G.S. A. & C. Black, Limited, London, England. [Price, 1s. 6d.]

Many of our readers know Miss Browne, whose contributions to THE INDIA RUBBER WORLD have been read with interest. She is the author of several books, one of which, in the series of "Peeps at Industries," is devoted to the rubber industry. Miss Browne is well qualified to write on these subjects, having visited many of the countries of South America, and having been associated with A. Staines Manders, the organizer of the International Rubber Exhibitions, to whom this book is dedicated. The book is one of the "Peeps" series of small, handsomely printed, concisely written books, and this one on South America is particularly attractive, having 12 full-page illustrations, reproductions of water-color sketches. In a volume of 88 pages only a fleeting view can be had of such a large country as South America, and Miss Browne is to be congratulated on getting so much in the way of facts concisely but entertainingly told in so small a compass. One of the chapters is devoted to "Para Rubber" and another to "A Voyage Up the Amazon." But, besides these, all the principal cities are briefly described, as is also the trip on the Trans-Andine railway to the West Coast. Four other trips—across Lake Titicaca, through the Panama Canal, up the River Magdalena in a house-boat to Bogota, and to the Kaieteur Fall of the Potaro River in British Guiana, are particularly interesting.

LIST OF PARA EXPORTERS AND IMPORTERS, 1915. PUBLISHED by the Associacão Commercial do Pará (Commercial Association of Pará, Brazil), in Portuguese, French and English, for free distribution. [8vo, paper cover, 104 pages.]

Giving expression to part of a program traced for itself, the Commercial Association of Pará is distributing without charge a complete list of exporters and importers established in that important trading center of Brazil.

Besides being a handy and serviceable directory this publication contains valuable information regarding Pará, its climate, its trade and banking statistics, its school for practical commerce and its commercial association.

The list of exporters opens with the names and addresses of crude rubber exporters, while the importers' list contains the names and addresses of importers of electrical instruments and apparatus, automobiles, department stores, importers of footwear, commission merchants, druggists, importers of hardware, telephones, the commercial agents and representatives of national and foreign houses, banks and exchange brokers, and a list of foreign consulates.

The book will be found valuable to all interested in commercial relations with the great trading and rubber exporting center of Northern Brazil.

NEW TRADE PUBLICATIONS.

THE March number of "Footprints," the house organ of the Canadian Consolidated Rubber Co., Limited, Montreal, Canada, is really a catalog of the many lines of footwear manufactured by that corporation. It is a handsomely printed pamphlet of 120 pages, almost every page containing one or more half-tone illustrations of the lines of footwear, which are fully described, giving all particulars so that dealers can order understandingly. Some of the pages are in color, where the goods are manufactured in other than black or gray rubber. Besides the catalog proper, there is an explanation of the standard assortment of case packings, showing the number of pairs of each size packed in a case unless ordered otherwise. There is a description of each last and outline cuts showing a side and sole view. Some pointers are given wearers on the care of rubbers and to dealers regarding fitting. The cover, printed in blue and orange, carries out the idea of the name "Footprints," the sub-title being so arranged as to simulate a footprint by the shaping and placing of the letters.

* * *

The United States Rubber Co. has been sending out to its footwear customers some attractive cut-outs to advertise their "Champion" tennis shoes. A square frame showing styles of tennis

shoes and the brands used upon them is so arranged that the "Champion" tennis cut-out boy can be so hung as to swing in this frame, balanced by his legs extending forward under the frame, the feet showing white tennis shoes with the "Champion" trade-mark upon them. The boy is an amusing little fellow who swings back and forth at every puff of wind and thereby makes an effective advertisement for this line of footwear, if hung in a window or suspended in a store. Another cut-out simulates the United States Rubber Co.'s patent pressure process "Storm King" boot, which is represented standing upon a box appropriately labeled and having at one end the newly adopted trade-mark of the company. The boot is in bright red and also shows the trade-mark on the front of the leg.

* * *

The Hyde Manufacturing Co., manufacturers of specialties in knives and cutting tools, Southbridge, Massachusetts, has issued Catalog R, this being devoted entirely to knives for rubber workers. One would hardly suppose so great a variety and number of different cutting tools are required in the rubber industry. In the thirty or more pages are pictured, described and priced several hundred knives, with points of every conceivable shape for the hand worker, square, half round, round bevel and taper point, tire knives, lathe knives, circular and machine knives. The catalog is excellently arranged and should find a place in every rubber factory.

* * *

The Peerless Rubber Manufacturing Co., New York City, sends out its catalogs in specially folded stiff paper covers, which allow a new page to be inserted where changes need to be made in the lists. Two of these catalogs relate to belting and packing, and both are handsome specimens of typography, each page being printed in two colors, the goods pictured in excellent half-tones and the description thorough in all respects. The belting booklet gives a considerable amount of information regarding the application of belting, horse power rules, pulley diameters, belt capacity, etc. Both books are likely to prove useful to the many customers of this concern.

* * *

"The Romance of Rubber" is the title of a little 24-page booklet published by The B. F. Goodrich Co., Akron, Ohio, to exploit its products. The plan of the book is to show at the top of each page a fine half-tone picture relative to the gathering or manufacture of rubber, while at the lower outside corner of each page is an appropriate picture of something relative to the gathering of rubber, or scenery in tropical countries. The text is informative, though it contains practically little that is not known to every rubber manufacturer and to most people in the rubber trade. In typography it is up to the high standard of the publications emanating from this enterprising company.

* * *

The United States Tire Co., New York City, has recently published a small vest pocket brochure that will interest the motorist who really wants to know the facts about individualized tires. The title is "Judging Tires," and it treats very pertinent questions, such as "Which type of tire will last longest on your weight of car," "Which type of tire will last longest under your road conditions," and other factors to be considered in the selection of tires.

* * *

The business of repairing pneumatic tires has become an important one and any measure which will advance the ability of repairers is one which will be truly welcome. The Goodyear Tire & Rubber Co., Akron, Ohio, has published a "Manual of Tire Repairing" which gives in condensed form, in a book of less than 50 pages, directions for repairing every sort of tire injury,—cuts and punctures, breaks in fabrics, blow-outs, rim cuts, as well as splicing inner tubes, relining and retreading, vulcanizing, etc. There are given besides this a form of tag and return check for repairers, a system of accounting, and a large number of illustrations showing the tools and machines necessary for the up-to-date repair business.

* * *

The Underwriters' Laboratories, Chicago, Illinois, whose work in connection with testing materials and appliances used in the prevention and suppression of fires is well known, has sent to all holders of its June, 1915, edition of "Standards for Rubber Covered Wires and Cables," 12 revised pages to take the place of the same number of pages in that edition. On account of the arrangement of the original edition these new pages can readily be inserted in their proper places and thereby render the book up to date. Most of the changes are explanatory, but some show changes of more or less importance. All changes are printed in italics and therefore can be easily and quickly distinguished.

* * *

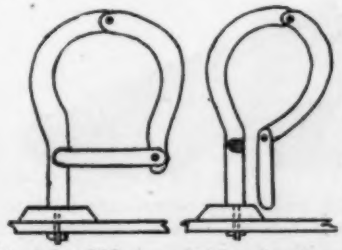
The Institution of Electrical Engineers, London, England, has sent THE INDIA RUBBER WORLD a copy of "Wiring Rules" issued by that institution, with extracts from Board of Trade and Home Office regulations for factories and workshops. This, as its name indicates, is a compilation in compact form of all the rules which are required by the British Government as regards wiring factories, workshops, mines, theaters and private houses. It tells what is required for insulation, classing vulcanized rubber insulation as Class A, while hygroscopic dielectric insulation such as impregnated paper or fiber is in Class B. The pamphlet also gives the thickness of rubber insulation required, and much practical matter of interest to those having charge of installing electricity. Among other changes in this edition may be mentioned provisions made for conductors with hard-rubber-compound protection.

REGISTRATION OF TRADE-MARKS IN LATIN AMERICA.

The American exporter or manufacturer selling goods in Latin America should protect his trade-marks. Attention should be called to the difference in the legal point of view as to the ownership of trade-marks between the Latin American countries and the United States. By the common law, use is the basis of property in a trade-mark, and registration in the United States is merely an additional means of protecting that property right acquired by use. In the Latin American countries, on the other hand, the rights of property in a trade-mark are derived entirely from the law and depend on the registration of the mark. Registration is usually granted without investigation of the right to its use, though after due notice to those interested by publication of the application in the official gazettes. When once effected, registration is final against all later comers. The importance of registration is therefore greater in the Latin American countries than in the United States, in view of the possibilities for unfair registration under the trade-mark laws in effect in those countries.

MAKING DIVING CAPS.

The diving cap is a quiet and unassuming affair compared to the ornate modern bathing cap, of which it is the prototype. Utility, rather than beauty, is aimed at in its design, but what it lacks in appearance it amply repays in efficiency, as every swimmer knows.



These are always made entirely by hand. The two pieces forming the cap are cut from a sheet of raw unvulcanized stock and the cemented seams united by a hand stitcher on the seaming form shown on the left. This form is hinged and provided with a short locking arm. When this is released the form collapses, as shown on the right, and the cap is removed and vulcanized.

New Goods and Specialties.

BATHING CAP NOVELTIES.

A TIMELY novelty in bathing caps is shown herewith, aptly named the "Aviator" because of its resemblance to the helmets worn by the drivers of air machines. The body of the cap is seamless and it is trimmed by hand. The crown is of natural pure gum color and the head-band of combination red and black, the decorative figures being either round, as shown in the illustration, or diamond or square-shaped. The turn-down piece, tied under the chin, protects the neck, ears and hair and renders this up-to-the-minute style of bathing cap thoroughly practical as well as ornamental.

The demure effect of the national headgear of Holland is cleverly obtained in the "Dutch Cap" also shown. It is hand-made, with a box-plaited crown and a tight head-band across the back. The pinked plaited edges becomingly frame the face, and four rosettes, two at the top and two at the back, add the further adorning touch desired by feminine wearers. This cap is furnished in a variety of colors—"Persian," red, blue, green, wistaria, tango, silver gray and pure gum.

Another popular cap simulates the bandanna handkerchief, being made with a two-colored bow and a two-piece body; while a turban cap is ornamented with buckles and a bow in front, and still another style has a crown fashioned in one-inch box pleats and a double head-band, the ornamental effect being obtained by the contrasting color of the outside band which is held in place by loops and has a flat, tailored bow on one side. [Faultless Rubber Co., Ashland, Ohio.]

MOURNING FOOTWEAR.

It is a somewhat sad commentary on the effect of the war that in Canada there is a demand for mourning shoes. Such footwear is now made in tennis lines, several styles, with white duck tops, cemented rubber soles, and black trimmings being designed to wear with mourning costumes. The one shown has a white duck top, edged with black, a black Cuban heel and a black rubber sole.

Another style has a colonial buckle and tongue, edged with black, with a wedge heel and sole of smooth, white rubber. A steadily increased call is noted for these goods. They are made in women's sizes only. [The Canadian Consolidated Rubber Co., Limited, Montreal, Canada.]

WET WEATHER SPORT GARMENTS.

The young woman of today goes in for athletics and stormy weather has no terrors for her. Because of this, manufacturers vie with each other in producing apparel for special wet weather wear, and two recent creations in this line are shown herewith.

One is a golf coat, exceedingly light in weight, made of rubberized silk in a handsome olive tan shade. This is so cut as to give plenty of room for the free play of the arms necessary in the various strokes of the game, and in order that such a coat shall be more comfortable it is ventilated under the arms, thus allowing for the circulation of air between the coat and the clothing of the wearer. With this a mannish hat of shower-proof gabardine is worn, and this, with a cravenetted skirt, or one of rubberized silk, completes the costume for the up-to-date player who wishes to go round the links in real Scotch golfing weather.

The other picture shows a female devotee of Izaak Walton, with her cravenetted thorn-tweed skirt and knickerbockers, Storm King rubber boots and leather coat. Thus appareled, she can defy the spray of the ocean or can wade through brooks in pursuit of her finny victims. These garments will commend themselves to up-to-date sporting goods and clothing dealers. [Abercrombie & Fitch, New York City.]

THE DURST ANTI-SPLASHER.

The unusual feature of this accessory to the kitchen sink consists in the body of the anti-splasher being made entirely of rubber. There is no metal sleeve to foul or rust and the threads that permit quick and easy attachment to the faucet are molded in the rubber body. The only metal in this device is the small tin-plated disk that forms the strainer that is located inside the body and protected by a rubber washer. Moreover, this anti-splasher and strainer also offers protection to the dishes and other breakable ware that through carelessness are broken by the unprotected metal faucet. [Durst Manufacturing Co., New York City.]

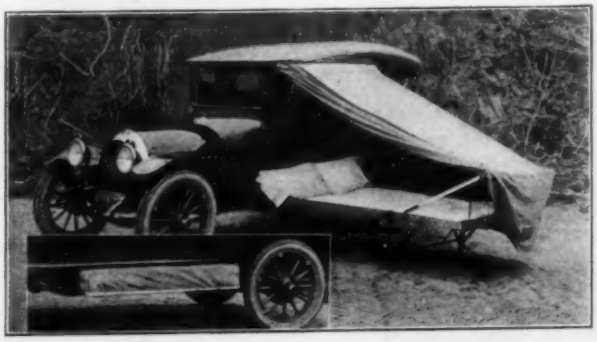
WATERPROOF PROTECTING TOWEL AND BATHING CAP.

The practical and convenient hair drying towel here shown is made of rubber and therefore affords complete protection while drying the hair after bathing or a shampoo. Or it may be used to keep the hair from the wet bathing suit, as shown in the illustration. This rubber towel is made up in a soft, peach-blow color, which should make it very attractive to feminine buyers. It has a narrow black band around the neck and is securely fastened in front by means of a collar button. A similar style of hair drying accessory is edged with rubber fringe.

The rubber cap also shown is a novelty "College" bathing cap. The under part fits closely over the hair as do ordinary bathing caps, while the top is stiffened to simulate the customary headgear of the college girl, a pendant tassel completing the resemblance. [L. C. Studios, New York City.]

AUTOMOBILE CAMP BED AND TENT.

There is an element of the nomad in many people. The get-back-to-nature desire is predominant in many minds. Gypsy life, with its freedom, has charms for thousands of urbanites. The automobile makes one independent of railroads, but not of hotels. Those who would carry their beds with them, and camp out where night overtakes them, will be interested in accompanying pictures showing an auto-touring sleeping device, a bed which



folds up in so small a space as to be readily transportable on the running board of the car, yet which when set up provides a comfortable bed for two people.

It is argued that the average collapsible cot sags to the middle, and is therefore uncomfortable for two sleepers. It is claimed this objection is overcome in this collapsible bed by producing a flexible spring mattress that will fold or roll into very small space, yet will not sag. The frame is of metal-capped wooden bars swiveled to the running-board, and a tent of heavy army khaki protects the sleepers. This gives the whole tonneau as a dressing room from which the tourists can step at once into the bed.

When collapsed the bed and tent roll into a compact space, as shown in the minor illustration. [L. F. Schilling Co., St. Joseph, Missouri.]

DOUBLE TEXTURE SLIP-ON.

There is an amount of style put into waterproof and weatherproof garments nowadays which commends them to a much larger circle of wearers than in the old days when such garments were less artistically cut and less handsomely finished. A glance at this picture of a 1916 slip-on will confirm this statement. It is made with a convertible collar, thus fulfilling its mission for rainy weather and yet rolling back at the lapels much the same as a regular overcoat. It is made 48 inches long rather than the usual slip-on length, which gives it a more stylish appearance. This coat is of double texture material, the goods being of fine quality and made up in a number of weaves of popular mixed fabrics, and linings of vari-colored plaids. The cutting and making are on a par with fine clothing lines and the result is a line of garments which will commend themselves to fine dressers. [C. Kenyon Co., New York City.]

PNEUMATIC RUBBER HEEL.

One objection to full heel tennis shoes is the weight of the solid rubber heel. A heel which, besides obviating the heavy weight of a solid block of rubber, is so constructed as to allow pneumatic action, thereby adding to its resiliency, is well shown in the accompanying illustration. This heel is hollow, but has in it three longitudinal partitions which add to its rigidity while forming a number of compartments or air cushions. The partitions mentioned have vents, one to another, as has also the breast of the heel, so that the air can escape from each chamber slowly. It is claimed that this makes a better wearing heel than one of solid rubber, besides having the added advantages of lightness and resiliency. [Hood Rubber Co., Watertown, Massachusetts.]

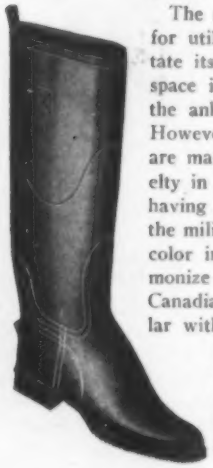
"THERMOID" GASOLENE HOSE.

Gasolene hose of inferior grade is an actual menace to life and property, and extended experimentation has resulted in a superior hose for garage equipment in which the rubber compounds used are warranted to resist the action of gasolene to an unusual extent. The "Thermoid" gasolene hose has been tested and approved by the Underwriters' Laboratories, Inc., and the quality and construction are examined and tested by them at regular intervals. This hose is made with either three or four plies of high-grade duck, the tube being lined with one-ply duck, which is reinforced and held in place by a flat, coiled steel wire. The wire-wound hose is machine wound with a very hard steel wire, which will not unwind if cut at any point and will not flatten under ordinary weight; yet the hose is very flexible and will not kink. [Thermoid Rubber Co., Trenton, New Jersey.]

"FRUNT-SEET" AUTO ROBE.

The new features of this auto robe, as indicated in the illustration, are the specially designed fastenings for attachment to the dashboard at the bottom of the windshield and to the sides of the car, and the special flap which fits around the steering wheel post. This robe will fit all automobiles, is quickly adjusted and detached, and not only keeps the cold out, but the heat of the engine in as well. It is made of black or green plush, lined with rubber and khaki cloth; also with heavy cloth lining and reversible, to fit right or left hand drive. [Automobile Apparel Co., Port Chester, New York.]

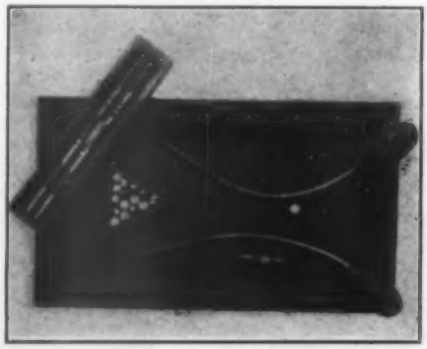
A TAN MILITARY RUBBER BOOT.



The standard rubber boot is designed mainly for utility, and its shape is such as to facilitate its easy drawing on and removal. Extra space is therefore allowed at the back, above the ankle, giving a rather clumsy appearance. However, close fitting and very shapely styles are made for military wear, and a recent novelty in this line is one in tan or brown rubber having the trim, straight lines which distinguish the military officers' leather footwear. This new color in the military boot is designed to harmonize with the modern field costume of the Canadian troops, and it has become very popular with the volunteers who have gone across the water to do their share in the fighting for the mother country. This boot is made only in men's sizes. [Miner Rubber Co., Limited, Montreal, Canada.]

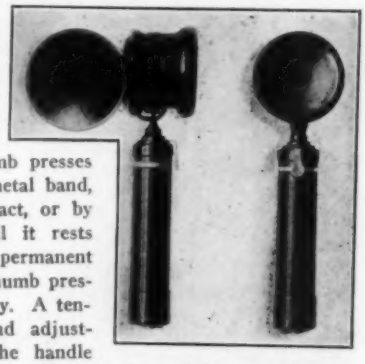
PNEUMATIC CUE FOR POOL.

A novel use of a rubber bulb is for the propulsion of miniature ivory pool balls upon a small pool table, in all dimensions proportionate to the full sized tables. Any shot which is possible on a regular sized table can be made on this. The cues, instead of being used to strike the white ball, are tubular, and connected with rubber bulbs, the force of the compressed air making the stroke. It is evident that this calls for a special degree of skill to manipulate the ball, which thus places this form of pool-playing in a class by itself. The table is of mahogany, the rubber cushions are silk covered, and all the appointments are of fine quality and in excellent taste, comparing most favorably with those of the regulation size table. [F. A. O. Schwarz, New York City.]



LORGNETTE ELECTRIC EAR-PHONE.

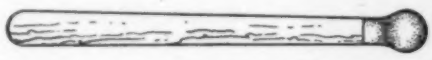
The ear-phone shown in the right illustration is made complete in itself, the electric battery being contained in the handle, eliminating the cords and trappings customary in devices for the use of deaf persons. The transmitter is made of hard rubber. By means of a small metal switch at the top of the handle, the electric current is turned on or off at will, thus avoiding any waste of electricity. A slight touch of the thumb presses the switch against the metal band, effecting temporary contact, or by moving the switch until it rests upon a metal projection, permanent contact is secured and thumb pressure rendered unnecessary. A ten-tone regulator for sound adjustment at the base of the handle controls the electric current and makes it possible to regulate the tone according to the preference or requirements of the individual. The battery is of the type used in all flash-lights, and therefore can be readily renewed in any city or town.



A similar model with the additional attachment of a megaphone concentrator on the transmitter is also shown. This concentrator, which is made of hard rubber, focuses the sound waves direct to the instrument. Both these instruments are guaranteed by the manufacturer for a period of ten years. [Globe Ear-Phone Co., New York City.]

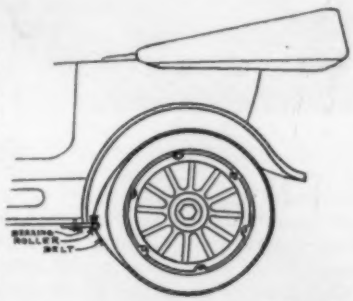
ICE PACKER WITH RUBBER BULB.

An improvement on the ordinary method of packing ice is shown herewith. The use of a stick to pack the ice between the coils of the ice chamber has frequently proved an expensive operation, owing to the breaking of the coils. The soft, white rubber bulb, of tough quality, and special shape and construction, at the end of this ice puncher prevents such accidents. Attached to a long handle, it affords a convenient and safe implement for packing ice. [The Schaefer Rubber Co., Cincinnati, Ohio.]



A NON-SKID TRACTION BELT.

A traction belt which the inventor claims will do the work of tire chains and more, has been developed by a Californian and tried out on both pleasure and commercial cars. It was designed at first to make traction in sand and was given its first tests in the unimproved roads of Arizona, where the loose, yielding surface makes it difficult for an ordinary tire to get a grip.



The endless balata gum belt is two inches wider, and considerably larger in diameter than the tire which it encircles. It travels over an idler roller, which revolves in bearings attached to the running board and keeps it in traction with the tire. In the illustration the device is shown ready for use. To remove the belt the outer bearing cap is unscrewed and the idler roller drawn out, leaving the belt free to be removed from the tire.

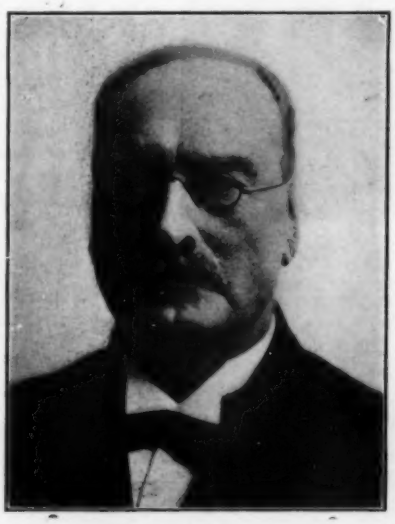
The Obituary Record.

PRESIDENT ALLIANCE RUBBER CO.

GEORGE C. RUSSELL, president and treasurer of the Alliance Rubber Co., Alliance, Ohio, died on March 30 at Los Angeles, California, having gone there in an endeavor to recuperate from an operation for cancer of the liver, to which he had submitted several months previous. Mr. Russell was born August 30, 1872, at Lockland, Ohio. He was at one time general manager of the Elliott-Fisher Typewriting Co., having his office in New York City. From there he went to the McCaskey Register Co., of Alliance, and in March, 1913, with Milton Bejach, who was also connected with the McCaskey company, he formed the Alliance Rubber Co., of which he was the president and treasurer, and started manufacturing molded specialties. Mr. Russell was a very energetic business man and interested in other manufacturing concerns in Alliance. He was also an enthusiastic collector of antiques and works of art, many of which he had gathered from all corners of the earth. He was twice married, and is survived by his second wife, who was Mrs. Ruby Jones McNair, of Newark, Ohio, and three children.

EXPLORED THE AMAZON.

Colin Mackenzie, whose explorations on the Amazon River were of material help to such men as Huber and others in botanical research in rubber lines, died in New York City on April 10 at the age of 79 years. He was born in Glasgow, Scotland, and once ran for Parliament against Lord James Bryce, former ambassador to this country, but was defeated. He explored and mapped out regions along the Amazon River, where he engaged in the rubber business. When he came to this country he settled in California, where he was naturalized. Mr. Mackenzie later became a resident of New York City, where at one time he was reputed to be the largest importer of coffee from South America. His Amazon experiences gave him a membership in the Royal Geographical Society, the Explorers' Club, and other scientific bodies. At the time of his death he was auditor of the Legal Aid Society, of New York City.



COLIN MACKENZIE

TWENTY-SIX YEARS AT WOONSOCKET RUBBER CO.

William Oswald Park, for seven years city clerk of Woonsocket, Rhode Island, and formerly mayor of that city, died recently of Bright's disease. Mr. Park was born in Roxbury, Massachusetts, December 28, 1863; was educated in the Boston public schools and moved to Woonsocket 33 years ago, entering the accounting department of the Woonsocket Rubber Co., of which plant his cousin, the late John F. Holt, was superintendent. Mr. Park remained with this company for 26 years, rising to the position of head office man and holding that position until he was elected city clerk in 1909. He was prominent in politics, having occupied the offices of councilman, alderman, mayor, clerk of the police commission, and city clerk. The last two offices he held at the time of his death. Mr. Park was also prominently identified with the Masons, the Woonsocket Business Men's Association and the Universalist Men's Club.

A PROMINENT CEMENT MANUFACTURER.

George David Hazen of the Hazen-Brown Co., manufacturer of rubber cement, died at his home in Brockton, Massachusetts, April 13, as the result of a long illness and a recent surgical operation. Mr. Hazen was born in Dixon, Illinois, nearly 50 years ago. His education in the public schools was supplemented by extensive reading and study. He was for several years employed as a chemist by Eugene Arnstein, Chicago, Illinois, manufacturer of cements, and about 10 years ago with Max Brown, who, until then, had been a salesman with the same concern, formed the Hazen-Brown Co., starting in a small shop in Brockton. As the business grew the factory has been repeatedly enlarged and branch offices were established in a number of manufacturing centers where the goods were in large demand. Mr. Hazen had long been a student and an investigator, and was an expert chemist. He took an active interest in politics, was a director in the Morris Plan Bank of Brockton, a member of the Commercial Club, Economic Club, Chamber of Commerce and Association of Superintendents and Foremen. He was an enthusiastic fisherman and knew well the best fishing places all over New England. He is survived by a widow and two daughters.

THIRTY-THREE YEARS WITH ONE CONCERN.

Edwin Wesley Deane, connected with the J. W. Buckley Rubber Co., New York City, for about 33 years, died recently at his home in Brooklyn, New York, aged 49 years. Mr. Deane came to the Buckley company from school, growing up in the rubber business. In 1910, when the concern was incorporated Mr. Deane was given an interest in the business and elected secretary of the company. He was well known to all the rubber trade and especially liked for his courteous treatment of every one with whom he came in contact. Mr. Deane was an example of a worthy, industrious and competent man, and his loss will be greatly felt, not only by his immediate associates but by many in the mechanical rubber trade. He was affiliated with high Masonic bodies, Royal Arcanum and Loyal Association. He is survived by a wife and daughter.

BUILT UP A LARGE WASTE BUSINESS.

Abraham Oppenheimer, senior member of the firm of Oppenheimer & Co., waste material and scrap rubber dealers, Buffalo, New York, died March 6 at his residence in that city. He was born in a small village in Messen, Darmstadt, Germany, in 1841, coming to America at the age of 14. He began his business career at Nunda, New York, removing to Westfield and then to Buffalo in 1871, where he built up an extensive business. He was a thirty-second degree Mason, a member of the Shrine and of the Acacia Club, and was an ex-president of Beth Temple Zion of Buffalo. He leaves a widow, three daughters and two sons, Nathan and Walter, who were associated with him in business.

PIONEER IN RUBBER STAMP BUSINESS.

George Kissam Cooke, the first man to manufacture rubber stamps in England, died at his home at Jamaica, Long Island, March 30, aged 72 years. Mr. Cooke was born in Hartford, Connecticut, and was a great grandson of Oliver W. Cooke, one of the founders of Yale University. He served in the Civil War, and, being a man of much ingenuity, invented a number of simple devices which ultimately brought him a large competence. Regarding the rubber hand stamp, it is stated that he learned the process in New York and went to London about the year 1872, establishing the business of G. K. Cooke, Hurls & Co., at 170 Fleet street, London, E. C., and in 1873 he took out a British patent for a dry heat process.

Mr. Cooke spent several years in traveling in European countries, and of late years has lived at the Kissam homestead, Kissam Place, Jamaica, New York. He is survived by a widow and two sons.

INSULATED WIRE SPECIALIST.

Charles Warren Bassett, who established the insulated wire department of the Washburn & Moen Manufacturing Co., Worcester, Massachusetts, 25 years ago, died at his home in that city March 31, aged 72 years. Mr. Bassett was considered an expert in his line, and managed the sales division of that department after the absorption of the Washburn & Moen plant by the American Steel & Wire Co. He was born in East Braintree, Massachusetts, and previous to assuming the above position was in business in Boston. He leaves a widow and two daughters.

FORMERLY WITH THE INDIA RUBBER WORLD.

James W. Burke, for some years connected with THE INDIA RUBBER WORLD, died on March 30 at Christ Hospital, Jersey City, New Jersey, of arterial trouble and pneumonia. Mr. Burke was born in Dublin, Ireland, December 13, 1847, and although he had but a meager school education, he studied under his father's guidance and became so well versed in several languages as to have been awarded prizes in German and French. At the age of 14 he entered the service of the Spanish consul in London, England. Two years later he went to Murdoch's Nephews, London, who later sent him to New York to open a branch office here. He was in their service for 36 years. On the death of the head of this firm he was successively with Doull Miller Co. and the National Association of Manufacturers, New York City. From there he came to THE INDIA RUBBER WORLD in 1911, where he did excellent work in the statistical and foreign correspondence departments, retiring because of ill health in November, 1914, this being his last business connection. Mr. Burke was a careful and efficient worker in his chosen departments, and a valued member of the staff of this journal. He was a musician of marked ability, both instrumental and vocal. He leaves a widow and three children, besides six children by a former marriage.

A WELL-KNOWN ENGLISH MANUFACTURER.

The death is reported of William McLean Henderson, managing director of the Ancoats Vale Rubber Co., Manchester, England. He went from Scotland about 40 years ago to this works, leaving to join, for some years, Broadhurst & Co., rubber manufacturers, a mile or so away, and afterwards returning to the Ancoats company as whip hand, at a time when its affairs were not in an altogether satisfactory condition. The present condition of the works and business is eloquent testimony to the business acumen of the deceased. Mr. Henderson was chairman of the India Rubber Manufacturers' Association in 1908.

HEAD OF A PROMINENT SCOTCH RUBBER COMPANY.

Lieutenant-Colonel David C. Campbell, V. D., of Messrs. Campbell, Achnach & Co., Thistle Rubber Mills Co., Glasgow, Scotland, died March 8 at his residence in that city, aged 57 years. Colonel Campbell had been connected with the rubber industry practically all his business life, becoming, with his brother, proprietor of the Thistle Rubber Mills in Glasgow in 1905, and on the death of his brother the following year, he became sole proprietor of the business, which was formed into a limited liability company in 1915, he being senior director and chairman of the new organization. Colonel Campbell was a man of genial and courteous disposition and had a wide circle of friends throughout the trade who respected him for his business ability and sterling integrity.

HAD MANY FRIENDS IN THE EAST.

William Johnstone, lieutenant of the Royal Highlanders (Black Watch) and brother of J. T. Johnstone of J. T. Johnstone & Co., crude rubber importers and dealers, New York and Akron, was recently killed in France. Mr. Johnstone was born, April 21, 1888, in Birkenhead, England, educated in English private schools, and later came to America where he attended the Newark High School at Newark, New Jersey.

WILLIAM JOHNSTONE.

He early developed a business talent that was recognized by a prominent American importing house dealing in wool and hides, and was sent to the Far East as their special representative and buyer.

At the outbreak of the war he returned to his home in America, and after a short visit, sailed April, 1915, for England, where he was gazetted to the 3d Battalion, Black Watch. Later, he was transferred to the 8th Battalion, which he joined in France December, 1915, and was killed March 30, while on patrol duty.

The deceased, while not directly connected with the rubber business, was well known in the Far East, where his many friends will be greatly saddened by the news of his death.

WIFE OF A PROMINENT RUBBER MAN.

The many friends of William W. Weitling, vice-president and treasurer of the American Hard Rubber Co., New York City, will sympathize with him in the loss of his wife, who died at their home in College Point, Long Island, New York, last week.

J. C. Rockwell, for many years in charge of the New York warehouse of the United States Rubber Co., died at his home in Brooklyn, New York, on March 4. Mr. Rockwell had many friends in the rubber business and will be greatly missed.

The estate of the late United States Senator Nelson W. Aldrich is estimated to be worth approximately $5,685,000. His son, Edward B. Aldrich, ex-president of the Continental Rubber Co., New York City, is executor of the estate, which he estimates as follows: Real estate in Rhode Island and Connecticut, $488,150; bonds in corporations, $600,214; personal property, $63,564; cash on hand or in bank, $100,154; accounts receivable, $500,154, and stocks in corporations, $3,932,870.

News of the American Rubber Trade.

SPECIALIZES IN RUBBER CUTTING KNIVES.

IN every rubber factory are likely to be found a variety of knives bearing a diamond-shaped trade-mark enclosing the name, I. P. Hyde. Mr. Hyde started the business of manufacturing shoe knives and shoe tools in Southbridge, Massachusetts, nearly 40 years ago, and that little business has grown until the plant of the Hyde Manufacturing Co., a picture of which is shown here, employs 75 experts in this special branch of manufacture. While this company's product includes many varieties of cutting tools for different trades, a very large proportion of its business is devoted to knives for rubber cutting. Probably this is the only concern in the country which issues a special catalog of such tools for use in rubber factories. The large business which is conducted by this company is the result of the

Factory of the Hyde Manufacturing Company, Southbridge, Massachusetts.

great care used in the hardening and tempering of each article to specially adapt it to the exacting requirements of the use for which it is intended.

CHANGES IN FISK ORGANIZATION.

E. H. Brodwell, vice-president of the Fisk Rubber Co., Chicopee Falls, Massachusetts, announces the following important changes among the officials:

J. A. Anderson has been appointed factory manager and will supervise the manufacturing departments. Mr. Anderson was connected with the United States Rubber Co. for many years in an executive position, joining the Fisk organization a year ago to do special work.

W. H. Whitlock continues as superintendent in charge of production and George A. Ludington, who was elected vice-president last fall, will devote his entire time to the buying of crude materials. Mr. Ludington's life-long experience in the rubber industry well qualifies him for this important service.

John Kearns, also a vice-president, will take charge of a newly created research department. Mr. Kearns is well known as a rubber and compound expert, having had a comprehensive experience both in this country and abroad.

MANTAU CHEMICAL CO. SUCCEEDS CAMDEN WHITE LEAD WORKS.

Harrison Bros. & Co., Inc., the old-established and well-known paint, chemical and white lead manufacturers, of Philadelphia, have purchased from the N. Z. Graves Corporation the plant formerly known as the Camden White Lead Works, Camden, New Jersey, where they manufactured lithopone and lead products, and will continue the business, with offices at 3500 Gray's Ferry Road, Philadelphia, Pennsylvania, which will be known as the Mantau Chemical Co., although it is owned outright and entirely controlled by Harrison Bros. & Co., Inc.

UNITED STATES RUBBER CO.'S NEW TRADE-MARK.

The United States Rubber Co. has decided to use a "super trade-mark" on all its goods, and to make it a point of honor to market under this mark only the best product—one which, in the words of the company, would mean as much in connection with rubber as the mark "sterling" means in connection with silver.

It consists of a ribbon appearing either on the article itself or in the advertising about any given article of rubber for which the company assumes responsibility. The ribbon is made up of three equal stripes; the centre stripe is white and the other two are blue. Upon the ribbon is placed the United States Rubber Co. seal or the trade-mark of one of the various subsidiary companies of the United States Rubber System. This ribbon carrying the seal or a merchandise trade-mark will be used to distinguish cartons, tire wrappings, boxes, etc., in which rubber products of known quality are packed.

RUBBER COMPANY DIVIDENDS.

A quarterly dividend of 2 per cent on the first preferred stock and a quarterly dividend of 1½ per cent on the second preferred stock of the United States Rubber Co., was paid April 29 to stockholders of record April 15.

The directors of the Kelly-Springfield Tire Co. have declared a quarterly dividend of 4 per cent on the common stock, payable May 1 to stockholders of record April 15. This is an increase of 1 per cent, the previous dividend having been 3 per cent.

The B. F. Goodrich Co. has declared a regular quarterly dividend of 1 per cent., payable May 15 to stockholders of record May 4. On April 26 another quarterly dividend of 1 per cent on the common stock was declared, payable August 15 to stockholders of record August 4.

RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of shares of rubber manufacturing companies on April 25 are furnished by John Burnham & Co., 115 Broadway, New York City, and 40 South La Salle street, Chicago, Illinois:

	Bid.	Asked.
Ajax Rubber Co. (new)	66½	67½
Firestone Tire & Rubber Co., common	805	815
Firestone Tire & Rubber Co., preferred	114	..
The B. F. Goodrich Co., common	75¾	76
The B. F. Goodrich Co., preferred	114	115
Goodyear Tire & Rubber Co., common	392	400
Goodyear Tire & Rubber Co., preferred	118	120
Kelly-Springfield Tire Co., common	71½	72½
Kelly-Springfield Tire Co., first preferred	97	98
Kelly-Springfield Tire Co., second preferred	..	..
Miller Rubber Co., common	285	300
Miller Rubber Co., preferred	115	..
Portage Rubber Co., common	84	86
Portage Rubber Co., preferred	108	110
Rubber Goods Manufacturing Co., preferred	..	..
Swinehart Tire & Rubber Co	84	86
United States Rubber Co., common	52⅛	52⅝
United States Rubber Co., preferred	107½	108½

SILVER KING GOLF BALL TRADE-MARK CHANGED.

John Wanamaker, exclusive distributor of the Silver King golf ball, found that the colored dot used to designate the different Silver King qualities, was trade-marked by A. G. Spalding & Bros. This difficulty, however, was overcome by the latter firm allowing this first shipment of infringing balls to be sold without interference. In the future the Silver King will be marked with a colored dash, red, green, etc., to denote the several grades.

REPORT OF RUBBER GOODS MANUFACTURING COMPANY.

THE Seventeenth Annual Report of the Rubber Goods Manufacturing Co., New York City, has been sent to the stockholders. The president's report describes the special conditions, adverse the first part of the year, with a marked improvement during the last four months of the year, and continuing up to the present time. It also tells of the enlargement of the principal tire plant.

The treasurer's report gives briefly the assets and liabilities, the net profits and dividends and the surplus at the close of the year 1915.

Both reports are given in full below:

THE PRESIDENT'S REPORT.

TO THE STOCKHOLDERS OF THE RUBBER GOODS MANUFACTURING CO.:

While the sales of the company, both in quantity and value, were larger in 1915 than in 1914, the net earnings were less on account of special conditions in the tire department. These adverse conditions made themselves felt throughout the entire heavy buying season, but from September on and continuing from January 1 of this year up to date a marked improvement has occurred in the tire department.

Still further expansion of our tire facilities has become necessary owing to the rapid increase in this business recently, and on account of these changes, necessitating the enlargement of the Morgan & Wright plant and the providing of additional working capital needed for the larger business transacted, we issued during the year and sold to the United States Rubber Co. $5,000,000 of 5 per cent debenture bonds of Morgan & Wright, maturing December 1, 1918.

The report of the treasurer appended hereto gives the consolidated general balance sheet and consolidated statement of the Rubber Goods Manufacturing Co. and its subsidiary companies for the fiscal year ending December 31, 1915.

Respectfully submitted,

ELISHA S. WILLIAMS, PRESIDENT.

THE TREASURER'S REPORT.

RUBBER GOODS MANUFACTURING CO. AND SUBSIDIARY COMPANIES.

CONSOLIDATED GENERAL BALANCE SHEET, DECEMBER 31, 1915.

ASSETS.

Property, plants and investments		$33,656,910.00
Inventories, manufactured goods and materials	$11,967,389.44	
Cash	3,556,440.96	
Bills and accounts receivable	7,829,575.81	23,353,406.21
Stock owned in General Rubber Co.	$1,666,700.00	
Securities owned	390,822.55	2,057,522.55
Sinking fund cash in hands of trustee		476,251.32
Miscellaneous assets		521,131.06
Total Assets		$60,065,221.14

LIABILITIES.

Capital stock, preferred	$10,351,400.00	
Capital stock, common	16,941,700.00	
Capital stock, subsidiary companies	3,500,000.00	$30,793,100.00
Bonds of Mechanical Rubber Co., and New York Belting and Packing Co.	$791,000.00	
Debentures of Morgan & Wright	5,000,000.00	5,791,000.00
Bills and accounts payable		10,667,700.24
Accounts payable to General Rubber Co.		1,106,331.17
Reserve for Federal income tax		31,605.65
Reserve for accidents to employes		111,489.14
Fixed surplus (subsidiary companies)		2,499,218.65
Surplus		9,064,776.29
Total Liabilities		$60,065,221.14

Contingent liabilities for certain guarantees, which are offset by corresponding contingent assets, are not included.

CONSOLIDATED SUMMARY OF INCOME AND PROFIT AND LOSS FOR THE YEAR ENDED DECEMBER 31, 1915.

Earnings		$2,037,744.68
Income from investments		133,336.00
		$2,171,080.68
Less:		
Expenses of home office	$108,664.59	
Interest on bonded and floating debt	700,644.18	
Federal income tax, 1915	31,605.65	840,914.42
Net Profits		$1,330,166.26
*Dividends		1,268,432.00
Surplus for the period		$61,734.26
Surplus, January 1, 1915		9,003,042.03
Surplus, December 31, 1915		$9,064,776.29

Respectfully submitted,

E. J. HATHORNE, Treasurer.

*Includes $205,000.00 paid minority interests in subsidiary companies.

The officers remain the same as last year; also the directors, with the exception of Charles A. Hunter, resigned.

PORTRAIT AND BUST OF GOODYEAR.

A window display of interest to everyone connected with the rubber business was arranged in the building of the United States Rubber Co. at 1790 Broadway, New York City. The central attraction was an oil painting of Charles Goodyear, which was painted on a sheet of hard rubber, about 1850, by the celebrated artist, G. P. A. Healy. This picture is considered the finest portrait of Mr. Goodyear extant. At the left was the bronze bust of Charles Goodyear, made by Tiffany & Co., which usually stands in the directors' room of the United States Rubber Co., a replica of which adorns the railway station at Naugatuck, Connecticut. Below was a very ornate piece of furniture, a desk or table made entirely of hard rubber. This piece of furniture was exhibited at the first World's Fair at the Crystal Palace in London in 1851, and was afterward used as a desk by Charles Goodyear. Besides this there were two canes, also made of hard rubber, one of which was carried by Mr. Goodyear in 1855 and the other was presented by him to Samuel Colt, grandfather of Samuel P. Colt, president of the United States Rubber Co. Below these, but not shown in our picture, were framed documents proving the authenticity of the articles.

WINDOW DISPLAY OF GOODYEAR RELICS.

REPORT OF THE CANADIAN CONSOLIDATED RUBBER COMPANY, LIMITED.

VICE-PRESIDENT and General Manager T. H. Rieder, of the Canadian Consolidated Rubber Co., Limited, under date of April 4 submitted his annual report covering the year ending December 31, 1915. He states that the volume of business done in 1915 was 20.43 per cent greater than in 1914. While the selling values of some classes of manufacture were advanced, others were reduced, so that the whole difference is very small. This increased volume was attained by the sale of automobile tires throughout the year, and by other lines especially during the last four months of the year.

Continuing, Mr. Rieder reports:

The stocks of raw materials show quite an increase, due to increased cost and somewhat larger supplies kept on hand. Manufactured goods show practically no change as a whole, although we were better prepared with tire stocks than the year before.

We have now completed a five-year period of our present sales plan and the position of your company in the rubber trade of Canada, as well as the profits, have progressively demonstrated the stability of this policy. Losses by bad debts spread over 15,000 active retail accounts have not been abnormal at any time during this period, and due to the policy pursued of making provision for possible bad debts, in proportion to sales, the unused reserve for bad debts is always ample.

Your directors sold November 1, 1915, 5 per cent short date debentures to the amount of $2,500,000. The proceeds were used to reduce existing bank loans, and resulted in a slight saving of interest.

The continuity of staff and management of your company has progressively manifested itself in efficiency and loyalty to your company and in its desire and ability to serve the retail trade in Canada.

All your properties have been maintained in first class operating condition. Any expenditures for repairs and replacements have been charged to cost of operating.

For 1916 your directors anticipate a continuance of the confidence which the retail trade has in the past given to your company. The year has started with good prospects and your directors have found it necessary to reopen the Granby footwear factory, which had been non-operative for two years, as the requirements of our new export department promise to overtax our mills now operating.

Mr. Rieder closed his report with a brief reference to the death of President McKechnie, on February 8, and an expression of appreciation of his many years of valuable service.

The financial statement of the company is given in full below:

COMBINED STATEMENT CONSOLIDATED AND CONSTITUENT COMPANIES, DECEMBER 31, 1915.

ASSETS.

Property and plants		$5,607,514.22
Inventories, manufactured goods and materials	$3,432,745.66	
Cash	71,180.65	
Accounts and bills receivable	1,490,492.65	
Investments, including good will	4,218,056.00	
Miscellaneous	276,675.50	
		9,489,150.46
		$15,096,664.68

LIABILITIES.

Preferred capital stock	$3,000,000.00	
Common capital stock	2,805,500.00	
		$5,805,500.00
Six per cent bonds due October 1, 1946		2,597,000.00
Five per cent debentures due December 1, 1918		2,500,000.00
Bills payable		871,297.04
Accounts payable and sundry accruals		460,487.82
Reserve for bad debts, depreciation, etc		172,081.06
Surplus		2,690,298.76
		$15,096,664.68

INCOME.

Net sales, footwear, tires, mechanical and miscellaneous	$7,522,147.40
Cost of goods sold, selling and general expenses, taxes, interest on borrowed money, repairs, depreciations, provisions for bad debts and tire replacements, net	6,987,168.87
Net profit from operations	$534,978.53
Dividends paid on preferred stock	192,123.75
Net addition to surplus	$342,854.78
Surplus January 1	2,347,263.99
	$2,690,118.77
Add adjustment ledger value to par on bonds of this company purchased under par	179.99
	$2,690,298.76

OFFICERS AND DIRECTORS OF THE CANADIAN CONSOLIDATED RUBBER CO., LIMITED.

At the annual meeting of the shareholders 11 directors were reëlected. The vacancies caused by the death of President McKechnie and the retirement of A. J. Kimmel were filled by the addition of R. C. Colt and W. A. Eden, both of Montreal, the full list being as follows:

Walter Binmore, Montreal, Quebec.
R. E. Jamieson, Montreal, Quebec.
E. W. Nesbitt, M.P., Woodstock, Ontario.
R. B. Price, New York City.
W. G. Parsons, New York City.
Homer E. Sawyer, New York City.
Elisha S. Williams, New York City.
Colonel S. P. Colt, New York City.
T. H. Rieder, Berlin, Ontario.
V. E. Mitchell, K.C., Montreal, Quebec.
R. C. Colt, Montreal, Quebec.
W. H. Robinson, Granby, Quebec.
W. A. Eden, Montreal, Quebec.

At a meeting of the directors following the shareholders' meeting the following officers were appointed: W. H. Robinson, president; T. H. Rieder, vice-president and general manager; W. A. Eden, secretary; Walter Binmore, treasurer; R. C. Colt, assistant secretary; A. Dwyer, assistant treasurer; J. P. B. Daigneau, assistant treasurer.

THE NEW YORK UNDERWRITERS' LABORATORIES.

The work of the electrical department of the Underwriters' Laboratories is conducted partly at the principal office and testing station in Chicago, and partly at the electrical testing station maintained in connection with the New York office. This arrangement, in effect since May, 1912, has been found to be very convenient and economical, inasmuch as a large proportion of the manufacturers of electrical wares are located in the east.

The electrical testing station in New York is located at 92 Vandam street, in a building adjoining a sub-station of the New York Edison Co. This location makes available for test purposes supply circuits of a range of voltage and current capacities that would be difficult to obtain elsewhere. When special apparatus requires facilities not furnished by the testing station equipment, arrangements are made for doing the work at the factories where the devices are made, or by means of special equipment arranged for the purpose. The station is provided with equipment for insulation resistance tests for rubber-covered wires, although most of this work is conducted at the Chicago office.

The New York office and electrical laboratory are in charge of Dana Pierce, vice-president; E. P. Slack and William Small, associate electrical engineers, and C. H. Holway, laboratory assistant.

UNITED STATES CUSTOMS RULING ON TOY BALLOONS.

A rubber balloon is a toy, even though it has an advertisement painted upon it. Such is the decision of Judge Sullivan in the case of Q. Nervione, Chicago, Illinois. This merchant imported small rubber balloons, some with and others without advertising matter printed on the sides. The collector levied 35 per cent duty on the articles on the ground they were "parts of toys." Entry at 10 per cent was asked under the provision for "manufactures wholly or in chief value of india rubber or gutta percha, not specially provided for." One of the protestant's witnesses testified that most of the balloons were sold for advertising purposes. The general appraiser claimed that nowhere in the record was there proof that the balloons were not used by children as playthings, or that they were reasonably fitted for other purposes. Affirming the collector, the decision held that advertising matter on balloons did not prevent a child from using them as playthings.

W. O. RUTHERFORD.

W. O. RUTHERFORD, the recently appointed general sales manager of The B. F. Goodrich Co., started with that company back in the nineties in a clerical position at the Akron office. From this position he advanced to a position in the sales organization at the Detroit branch. Early in 1910 he was made manager of the Denver branch. A year and a half later he was promoted to the position of branch manager in Buffalo, where his services during the eight years that followed were largely responsible for the popularity of Goodrich products in that district. In July, 1910, he was brought back to Akron as assistant to H. E. Raymond, who has relinquished the office of general sales manager, but will continue actively as vice-president, exercising general supervision over sales and advertising policies.

W. O. RUTHERFORD.

The title of assistant general manager of sales was formally conferred upon Mr. Rutherford in March, 1914, and his election as head of the Goodrich sales organization is the latest step in a career that has been an unbroken record of real achievement.

Unlike the duties of a sales manager who has one of a few products on which to concentrate his efforts, Mr. Rutherford directs nearly 500 salesmen of the most extensive lines manufactured in America, and there are seventy odd branches and depots scattered throughout the country.

Mr. Rutherford brings to his new position the ripe experience of a successful field salesman, together with a rare knowledge of men and how best to inspire them with his own enthusiasm and aggressiveness.

THE NEW YORK PREPAREDNESS PARADE.

A meeting of New York's representative rubber men was held at the Waldorf-Astoria on April 11 to organize the Rubber Division of the Preparedness Parade that takes place in New York City Saturday, May 13.

George B. Hodgman, Hodgman Rubber Co., presided, and introduced the several speakers. A committee was appointed, consisting of H. G. Cleveland, chairman, Harry S. Vorhis and W. G. Ryckman.

Through the exertions of this committee, a widespread interest and enthusiasm has been generated and the rubber trade will undoubtedly form an important part of the procession, and be most creditable to this industry.

Amadee Spadone, of the Gutta Percha Rubber Manufacturing Co., has been appointed marshal of the rubber division. He will appoint his own staff.

Two bands have been engaged for this division, which is expected to be assigned a position immediately after Mayor Mitchel and his escort, thus heading the parade. The Rubber Division will assemble at 8:30 A. M. on Duane street, with head of column resting on Broadway, and will move at 9:30 sharp, which will enable this division to dismiss at noon.

Trade banners will lead the various divisions of representative rubber concerns, each man carrying an American flag, and wearing an arm band bearing the legend "The Rubber Club of America, Inc."

Many rubber concerns report their intention of being represented, and from present indications, there are likely to be between 2,000 and 3,000 men in this division.

RUBBER CLUB EXECUTIVE COMMITTEE MEETING.

The Executive Committee met on April 14 with the following members in attendance:

President Harvey S. Firestone, chairman; George B. Hodgman, William E. Bruyn, Van H. Cartmell and Henry C. Pearson.

The business relating to the election of standing committees resulted as follows:

NOMINATING COMMITTEE.

Homer E. Sawyer, chairman, United States Rubber Co., New York City.

Bertram G. Work, The B. F. Goodrich Co., Akron, Ohio.

Charles T. Wilson, Charles T. Wilson Co., Inc., New York City.

Henry C. Pearson, India Rubber Publishing Co., New York City.

Russell Parker, Parker, Stearns & Co., Brooklyn, New York.

BANQUET COMMITTEE.

George B. Hodgman, chairman, Hodgman Rubber Co., Tuckahoe, New York.

Henry C. Pearson, India Rubber Publishing Co., New York City.

William T. Cole, Fabric Fire Hose Co., New York City.

OUTING COMMITTEE.

Philip E. Young, chairman, Acushnet Process Co., New Bedford, Massachusetts.

Robert L. Rice, Hood Rubber Co., Watertown, Massachusetts.

Francis H. Appleton, Jr., F. H. Appleton & Son, Inc., Boston, Massachusetts.

The following were nominated as chairmen of district committees, with power to appoint the local members:

For Akron, Ohio, W. O. Rutherford, The B. F. Goodrich Co.

For Trenton, New Jersey, J. S. Broughton, United & Globe Rubber Manufacturing Cos.

For New York City, Clarence H. Low, United States Rubber Reclaiming Co.

The following were admitted to membership:

FIRM MEMBERS.

Goodyear Tire & Rubber Co., Newell C. Shepard, New York City.

Quality Tire & Rubber Co., Charles A. Besaw, Hartville, Ohio.

ASSOCIATE MEMBERS.

Samuel Rosenblatt, Boston, Massachusetts; Plymouth Rubber Co., Canton, Massachusetts.

William E. Green, Boston Belting Co., 100 Reade street, New York City.

CHANGES AND APPOINTMENTS, GOODYEAR TIRE & RUBBER CO.

R. W. Rost, Newark, New Jersey, salesman, has been promoted to managership of the Goodyear branch at Albany, New York, succeeding E. B. Sigerson, recently appointed manager of the Buffalo branch.

J. A. Leatherman, Portland, Oregon, salesman, has been made manager of the branch in that city.

L. H. Vaughan, former manager at Utica, New York, has been appointed manager of Goodyear's branch at Newark, New Jersey. He is succeeded at Utica by F. G. Richards, who has been connected with the Newark branch as salesman.

THE DEAN OF RUBBER ADVERTISING.

THE press of the country is taking note of the fact that E. C. Tibbitts has been advertising manager of The B. F. Goodrich Co. for twenty years. Incidentally the newspapers are saying some very nice things about the gentleman anent his twentieth commercial birthday. As a matter of record, Mr. Tibbitts has undoubtedly held down his special job longer than any man in the trade. He came at a time when the company was just entering upon its wonderful and symmetrical expansion. When the young giant among rubber companies struck its gait it took a keen intellect in the publicity field to keep ahead of it. Those familiar with Goodrich advertising will agree that Mr. Tibbitts showed both the necessary speed and endurance.

E. C. Tibbitts.

A mental review of the publicity efforts that have come from under the deft hand of this advertising manager tells the story. They are all individual, are free from bombast, and are singularly sincere. They embrace all lines of publicity, replicas of notable portraits, beautifully illustrated booklets, libraries of route books, sign posts at every country cross roads, lectures, "movies," window displays, newspaper specials, a bright "house-organ" and so on, ad infinitum.

In all this Tibbitts is the suggester, writer, critic and editor. A huge task—it is well done—and we tender our congratulations and felicitations to that unassuming gentleman who signs himself "E. C. T."

TRADE NOTES.

The Birmingham Iron Foundry, Derby, Connecticut, is remodeling its plant and adding a wing 62 x 208 feet, with bay 40 x 140 feet, the new part to be all steel construction, with Fenestra steel sash and mostly glass. There will also be a flask storage runway, 35 x 140 feet, with traveling crane. Contracts for these additions have been placed, including four traveling cranes, and it is expected that the work will be completed by August 1.

A permanent injunction has been issued in the suit of the Royal Equipment Co., Bridgeport, Connecticut, against Max Rich and the Rich Auto Supply Co., New York City, restraining Rich from infringing the Royal company's rights by using the Raybestos trade-mark and silver edging on brake lining, and calling for the destruction of all offending lining and literature.

J. P. Devine Co., New York City, manufacturer of vacuum dryers, vulcanizers and other specialties, will remove the first of this month to the 20th floor of the Forty-second street building, gaining thereby nearly three times as much floor space as in the old quarters on the third floor of the same building as well as the greater light and quiet obtainable higher up. The offices will be newly furnished, with special reference to a more convenient conduction of the company's New York business. L. W. Treichler will continue in charge, and Mr. Devine will probably spend more time in the New York office than he has hitherto.

The Picher Lead Co., Joplin, Missouri, which has plans for a smelter at Henryetta, Oklahoma, will install equipment for a 4000-retort plant. M. R. Bump, Henryetta, is construction engineer in charge.

A serious strike situation is noted at the plant of the National Cable & Conduit Co., Hastings-on-the-Hudson, New York. This company has been manufacturing war munitions and employing about 3,500 hands. About one-third of the number walked out on the 13th and 14th, and on the 17th the strikers attacked the deputy sheriffs, stoned those who remained at work, broke every window on the front of the long factory, and threw stones through the windows of passing railroad trains. The militia was called out to preserve order and to protect the factory, which closed down, pending a settlement, which was reached on the 26th, by the workmen accepting the company's offer of an increase of 2 cents an hour. The plant resumed operations on the 27th ultimo.

The Durst Manufacturing Co., Inc., manufacturer of mechanical rubber goods and plumbers' specialties, has moved to 105-107 Chambers street, New York City.

Additions and improvements are being made in the Revere Rubber Co.'s New York offices at 59 Reade street, of which H. L. Williams is general sales manager.

Gustave Kush, manufacturer of mechanical rubber goods, has removed from 60 Beekman street, New York City, to 3 Park Row, where he now has his office at room 41.

The I. J. Cooper Rubber Co., Cincinnati, Ohio, has increased its capital stock from $100,000 to $225,000.

The Textile Machine Works, Reading, Pennsylvania, has been authorized to increase its capital stock from $60,000 to $1,500,000.

Adolph Hirsch & Co., importers and dealers in crude rubber, have removed to new offices in the World Building. Their address is now Suite 717 to 722, 56 Park Row, New York City.

George E. Austin Co., mechanical and electrical goods, and the Imperial Rubber Co., George E. Austin, general manager, New York City, have removed their offices to the Equitable building, 120 Broadway.

On April 19 meetings were held simultaneously in New York City, Chicago, Illinois, and Los Angeles, California, by members of the Transcontinental Purchasing Agents' Association. The three cities were connected by telephone, and receiving instruments distributed to all who attended enabled them to listen to remarks made in each of these cities, also vocal selections, while the eastern members were enabled to hear the roar of the surf of the Pacific Ocean, thousands of miles away. The Chicago meeting was presided over by F. A. Marsh, purchasing agent for the Link Belt Co., Chicago. In the list of directors may be noted E. L. McGrew, of the Standard Underground Cable Co., and F. W. Lingley, of the American Hard Rubber Co.

At a meeting of creditors of the American Rubber Reclaiming Co. and the Germantown Almegum Manufacturing Co., both of Germantown, Philadelphia, Pennsylvania, a committee was appointed to investigate and recommend upon the prospect of reorganizing the first named company, whose assets were appraised at $85,437.62. The liabilities amount to $143,281.18, of which $37,000 is doubtful. The assets of the Germantown Almegum Manufacturing Co. were appraised at $33,586.50 and liabilities at $234,455.42.

Commodore E. C. Benedict, formerly director of the United States Rubber Co., New York City, who has an extensive and beautiful estate at Greenwich, Connecticut, proposes at his own expense to convert it into a model bird sanctuary on plans laid down by the Greenwich Bird Protective Association, an organization of prominent and wealthy residents of that town.

NEW INCORPORATIONS, WITH AUTHORIZED CAPITAL, ETC., 1916.

Allen Tire & Rubber Co., The, March 21 (Ohio), $10,000. Frank J. Allen, W. H. McMorris, Joseph N. Ackerman, David L. Shaw and S. Milder. Principal address, Cleveland, Ohio. To deal in rubber tires.

Allen & Reeves Shoe Co., Inc., March 6 (New York), $25,000. William J. Allen, James E. Reeves and Harry E. Reeves—all of Watertown, New York. Shoes, rubbers, etc.

Buffalo Tire Service Co., Inc., April 7 (New York), $1,000. A. Foshay, 120 Broadway, Russell Goldman, 1190 Madison avenue—both in New York City, and J. Oliver Murphy, Mount Vernon, New York.

Central Auto & Tire Co., Inc., February 11 (Iowa), $10,000. T. L. Kennedy and O. R. Arnold. Office, Davenport, Iowa. To deal in second-hand automobiles, accessories, etc.

Dunlop Tire Sales Co., Inc., April 13 (New York), $1,000. Otto and L. A. Braunwarth and Albert Bracht—all of 1808 Broadway, New York City.

Effpee Manufacturing Co., Inc., March 6 (New York), $10,000. Max S. Levine, 321 Stone avenue and Beatrice Markowitz, 1272 41st street—both in Brooklyn, New York, and Harry Dobel, 483 East 170th street, New York City. To manufacture gaiters, rubberized materials, etc.

E-Z On Fastener Co., Inc., April 3 (New York), $50,000. Seymour Bookman, 144 West 77th street, and Ethel Beneau, 17 East 105th street—both in New York City, and Samuel H. Harris, 449 Greene avenue, Brooklyn, New York. To manufacture devices for automobiles of rubber and other materials.

Fellsway Rubber Co., April 5 (Massachusetts), $95,000. Louis H. Williams, Framingham; Franklin P. Gowing and Joseph E. Eaton—both of 230 Purchase street, Boston—both in Massachusetts. Factory and principal office, 30 Locust street, Medford, Massachusetts. Louis H. Williams, president. To manufacture mechanical molded goods, especially rubber soles and heels.

Giant Rubber Co., Inc., April 25 (New York), $50,000. Abraham Feldman, 519 Willoughby avenue, Brooklyn, New York; Alexander Weiss, 711 East Twelfth street, and Norman N. Nacman, 233 Broadway—both in New York City. To manufacture rubber goods, tires, etc.

J. & D. Tire & Rubber Co., April 8, 1916 (North Carolina), $500,000. Par value of shares $100. C. C. Coddington and T. C. Guthrie—both of Charlotte, North Carolina, and H. O. Smith, Indianapolis, Indiana. Office, Charlotte, North Carolina. To manufacture pneumatic tires.

King Tire & Rubber Co., Inc., April 13 (New York), $1,000. C. O. Henderson, 103 Kensington avenue, Herbert T. Auerbach, Statler Hotel, and John H. Trauter, 101 Crescent avenue—all in Buffalo, New York.

King Tubeless Rubber Co., March 15 (Delaware), $300,000. E. D. Buck, George W. Dillman and M. L. Horty—all of Wilmington, Delaware. Office, 328 du Pont building, Wilmington, Delaware. To sell and manufacture all forms of King tubeless patent tires for automobiles, auto trucks, etc.

Marathon Tire Co. of New England, April 12 (Maine), $100,000. George F. Gould, president and treasurer; N. M. Kent, director, both of Portland, Maine. Office, Portland, Maine. To manufacture and deal in rubber goods, rubber tires, etc.

National Adhesive Co., Inc., The, March 17 (Massachusetts) $15,000. Earl F. Olson, 86 Norfolk avenue, Swampscott, Massachusetts; Ethel J. Looke, 76 Michigan avenue, and Joseph F. McGrath, 28 High Rock street—both in Lynn, Massachusetts. Office, Lynn, Massachusetts. To deal in rubber cements of all kinds, rubber heels, etc.

New York Rubber Disc Co., Inc., April 21 (New York), $2,000. Harry Kovinow and Morris Manofsky—both of 1713 Third avenue, and Morris Kavenoff, 152 East 103d street—both in New York City. Rubber supplies and discs.

Peters-Tucker-Hay Rubber Co., March 18 (Colorado), $5,000. H. G. Peters, E. M. Tucker and R. E. Hay—all of Denver, Colorado. General auto accessories and filling station company.

Portland Vulcanizing Co., March 22 (Maine), $10,000. Philip J. Lanicault, president; Conrad T. Beardsley, treasurer, and Harold H. Wish, director—all of Portland, Maine. Office, Portland, Maine. To manufacture and deal in rubber tires, etc.

Orange Vulcanizing & Supply Co., February 18 (New Jersey), $50,000. James J. and Annie Davis, Peter T. and Elizabeth D. Loughlin—all of 225 Main street, Orange, New Jersey. To deal in automobile accessories, etc.

Never-Hole Tube Co., March 30 (Delaware), $300,000. H. H. Waller, G. E. Toulopoulos and M. Friedberg—all of 140 Nassau street, New York City. Office, Capital Trust Co., Dover, Delaware. To manufacture and deal in inner tubes and automobile tires.

Quaker City Rubber Co., March 31 (Pennsylvania), $5,000,000. Charles A. Daniel, William F. Metzger and James T. Moore—all of Philadelphia, Pennsylvania. Office, Philadelphia, Pennsylvania. To manufacture and deal in crude rubber, balata and gutta percha, and all and any of the products into which crude rubber, balata or gutta percha, in any form enters as a constituent part.

Rex Scrap Iron & Rubber Co., Inc., The, April 18 (New York), $1,000. Morris Korn and Morris Jaffee—both of 336 Dumont avenue, and Frank Tindler, 482 Sackman street—both in Brooklyn, New York.

Robert Soltau & Co., Inc., April 24 (New York), $50,000. George Hammerlund, 866 Forty-ninth street, Brooklyn, New York; Charles Oakes, 45 East Eighty-third street, and E. G. Reardon, 541 East Seventy-eighth street—both in New York City. To manufacture gutta percha tissue, rubber products including "Galalith," etc.

Standard Chicle Refining Co., April 7 (Delaware), $110,000. Orja G. Corns, Valdamar A. Johnston, Jr., Matthew E. Hosely and Adolph P. Rapp—all of Chicago, Illinois. Office, Capital Trust Co. of Delaware, Dover, Delaware. To refine or manufacture a substitute for chicle, and to manufacture rubber or any article having for its base rubber, chicle or natural gum.

Triple Tread Tire Co., March 20 (Delaware), $500,000. H. G. and M. Lund and Edward Grunich—all of Chicago, Illinois. Office, Guarantee & Trust Co., Ford building, Wilmington, Delaware. To manufacture and deal in automobile tires, tubes, etc.

Triumph Tire & Rubber Co., April 5 (New York), $1,000. George L. Campbell, 415 West 141st street; George T. Bernard, 294 Sixth avenue, and Garrett Cooper, 166 West 72d street—all in New York City.

Tropical Shipping & Trading Co., Inc., The, March 17 (New York), $40,000. Adrian Cairns, 4111 Ferris street, Woodhaven, New York; Oswald Carliss, Sterling, and W. A. Black, Montclair—both in New Jersey. To deal in rubber, precious woods, ivory and other tropical products.

White's Spring Tire Co., March 7 (Oklahoma), $50,000. Jesse W. White, M. J. O'Connor, John F. Sumner, Elta H. Jane, H. S. Bruner and L. E. Jalbert—all of Edmond, Oklahoma, and F. H. Bean, Los Angeles, California. To manufacture and deal in automobile accessories and to manufacture and deal in White's cushion automobile tire.

Yankee Tire & Rubber Co., Inc., April 3 (New York), $3,000. Randolph Russell, Livingston, Richmond County, New York; Harry E. Dodge 113 East 80th street, and Charles McAlpin Pyle. 11 East 68th street—both in New York City.

PERSONAL MENTION.

Edward H. Huxley, president of the United States Rubber Export Co., arrived from England on the steamer "St. Paul" on April 14. Mr. Huxley, it will be remembered, was a passenger on the "Sussex" when she was destroyed on March 24. His prompt and thorough report of the affair to the United States Government brought him commendation from newspapers all over the country.

J. P. Krentz, formerly superintendent of the foundry of the Buffalo Foundry & Machine Co., Buffalo, New York, has been appointed works manager of the company.

Eugene Pearl, the many-sided man—artist, attorney and ininventor, whose corset shield and syringe nozzle patents have been mentioned in THE INDIA RUBBER WORLD, has just invented an anti-skid shoe support for bootblack stands, the idea being to hold the shoe steady under the manipulations of the polisher.

Victor von Schlegell was recently elected vice-president of the United & Globe Rubber Manufacturing Cos., Trenton, New Jersey, with headquarters in the Equitable building, New York City. Franklin Edson has been made assistant to Mr. von Schlegell.

R. L. Chipman, dealer in crude rubber, gutta percha and allied gums, has moved into more commodious quarters at 23-25 Beaver street, New York City.

The Rev. Dr. W. Warren Giles, of Orange, N. J., who has been a speaker at several dinners of The Rubber Club of America, Inc., while running for a train recently, failed to see a train approaching from the opposite direction and was knocked down and severely bruised. His many friends in the rubber trade will be glad to know that he is now as well—and as witty—as ever.

Albert Waterhouse, president, The Waterhouse Co., Limited, Honolulu and Singapore, was in New York last month on business pertaining to the various interests managed by his company. He reports that the Pahang and Jahore plantations, through the agency of the Waterhouse company, are progressing under most favorable circumstances.

W. Stuart Gordon, well known crude rubber man, formerly of Manaos, who recently arrived in New York from the Far East, sailed for Para April 26.

Francisco Conde de Athayde, a well known rubber merchant of Manaos, Brazil, is in New York on a two months' business trip.

Andrew Kangas, formerly with the commission house of Thomsen & Co., New York City, has become assistant export manager for the Fisk Rubber Co., Chicopee Falls, Massachusetts, assisting John B. Maus.

W. K. Frederick has been appointed assistant sales manager of the Batavia Rubber Co., Batavia, New York. Mr. Frederick was formerly special jobbing representative in the middle west for the Pennsylvania Rubber Co., and later with the McGraw Tire & Rubber Co.

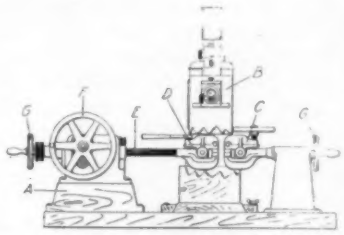
The McGraw Tire & Rubber Co. of New York, Inc., with general offices and works at East Palestine, Ohio, announces that C. E. Wertman, formerly assistant branch manager, has been promoted to the position of resident manager of the New York office, succeeding R. F. Hobron, and that E. E. Cowan has been appointed sales manager of the New York territory.

The Associated Garages of America has changed its name, to represent its varied interests more accurately, to the National Retail Automobile Trade Association.

At the twentieth annual meeting of the National Fire Protection Association, to be held at Chicago, Illinois, May 9, 10 and 11, one subject to be considered and discussed will be "Standard Hose Couplings and Hydrant Fittings for Public Fire Service."

TIRE FABRIC TESTS SHOWN BY LANTERN PROJECTION.

THE wide difference of opinion regarding the testing of fabrics is doubtless due in a large measure to the inaccuracy of the apparatus employed. Great variations are obtained from the same fabric tested on the same dynamometer when held by different means. It is, therefore, obvious that the more data submitted under these varying conditions, the wider the difference of opinion may be. Textile fabrics, owing to their nature and lack of sharp outline, are difficult to reproduce by photographic means. Lantern slides, or motion pictures, when magnified and projected upon a screen are too indefinite to illustrate the actual effect of stress upon the fabric. The value of motion photography for this work is greatly lessened by the fact that a film is usually in constant motion and a more deliberate study of the sample is impossible.



Henry L. Scott & Co., manufacturers of rubber testing machines, conceived the idea of reproducing or projecting upon a screen by means of an opaque projection lantern a highly magnified view of a fabric sample during a test. The apparatus shown in the cut was therefore constructed and exhibited before Committee D-13 of the American Society for Testing Materials in the office of the United States Rubber Co., New York City, on March 17.

Parts of a standard horizontal tire fabric tester were mounted upon an oak base *A* constructed to also support a Balopticon lantern *B*. No recording head was used. The fixed clamp *C* was held rigidly in a horizontal position on a solid iron frame attached to the base. The moving clamp *D* was attached to a draw bar, or stretching screw *E*, operating through a gear box holding the driving mechanism. Hand wheels *F* on either side of the gear box were used to transmit power to the stretching screw and were geared to give any speed desired. The hand wheels *G* at each end of the machine permitted changing clamps quickly. Knurled and adjustment collars, movable upon the thread of the stretching screw, assured the return of the moving clamp to the same position for each sample.

In addition to the flat grip clamps shown in the drawing, other devices were used and by means of interchangeable anvils or gripping surfaces several methods of testing were illustrated. A device was also arranged for working two knives underneath the sample to cut the fabric in such manner as to produce the "gash" test.

The apparatus was installed in a darkened room and the projection made upon a special aluminum screen at a distance of approximately 20 feet. As nearly all tests were made on tire fabric, having 23 ends per inch, each end thus projected was about 1 inch in diameter. Samples were broken in a bone-dry, normal and saturated condition to note the effect of moisture. Tests showing the effect of varying speeds of the moving clamp were also made.

Elongation, number of threads broken, effect of tension, slip in the clamps and comparative values of different methods were readily observed. As innumerable tests could be made and any test repeated, the speed regulated, or the stretching motion stopped for any length of time desired, many interesting points were brought out.

THE GRANT SOLID TIRE PATENT LITIGATION.

THE Circuit Court of Appeals, in New York City, affirmed the decision of the lower court March 17 in the suit between the Diamond Rubber Co., New York City, and the Kelly-Springfield Tire Co., Akron, Ohio. Approximately $210,000 damages were awarded to the latter company for infringement of the Grant solid tire patent owned by the Kelly-Springfield company. This sum includes five cents per pound on the sales of infringing tires, amounting to over $130,000, $27,000 for interest, and an additional $50,000 "smart money," because of the flagrant character of the infringement.

As this famous patent has been the subject of almost constant litigation since 1896, and suits are still pending, a brief review of the principal facts furnished by a representative of the Kelly-Springfield company is interesting.

The Grant patent No. 554,675 covers the solid rubber tires now commonly used on horse-drawn vehicles throughout the world, and was granted to Arthur W. Grant February 18, 1896. At once, upon its introduction, it drove all other solid rubber tires out of the market, and after becoming established, its sales amounted to around 10,000,000 pounds of tires every year. The patent was infringed almost from the beginning, principally by rubber manufacturers, who endeavored to imitate it and avoid infringement, but their imitations were all short-lived and failures.

Many of the principal rubber companies were prosecuted for infringement, among them The B. F. Goodrich Co., Akron, Ohio; Diamond Rubber Co., Akron, Ohio; Firestone Tire & Rubber Co., Akron, Ohio; Pennsylvania Rubber Co., Jeannette, Pennsylvania; Republic Rubber Co., Youngstown, Ohio; Victor Rubber Co., Springfield, Ohio; Acme Rubber Manufacturing Co., Rutherford Rubber Co. and Thermoid Rubber Co., of Trenton, New Jersey; Hartford Rubber Works Co., Hartford, Connecticut; Morgan & Wright, Detroit, Michigan, and others.

In 1911 the Firestone Tire & Rubber Co. paid damages for infringement. This company also acquired a manufacturing license for the balance of the term of the patent, which expired February 18, 1913. Morgan & Wright acquired a manufacturing license about the same time and paid damages for past infringement.

In the case against the Goodyear Tire & Rubber Co. the defendant won and the patent was declared void in 1902, but subsequently it was adjudged valid by the Federal Courts in Milwaukee, Wisconsin, and New York City, and later on by the Supreme Court at Washington, D. C., after which settlements and adjustments were made.

The decision at Washington, while not directly in the Goodyear case, made the customers of that company liable for infringement and the Goodyear Tire & Rubber Co. made satisfactory settlement. The Thermoid Rubber Co., the Acme Rubber Co. and the Rutherford Rubber Co. also settled, the former paying damages and the other companies making satisfactory arrangements.

Cases are now pending against the Republic Rubber Co., Youngstown, Ohio; the Pennsylvania Rubber Co., Jeannette, Pennsylvania; two cases against The B. F. Goodrich Co., Akron, Ohio, and three cases against the Diamond Rubber Co., Akron, Ohio. Decrees in favor of the plaintiff have been entered in all of these cases and the matter is now before the masters on the accounting, except in the case against one of the Diamond rubber companies, viz., the Diamond Rubber Co. of New York. In this case the plaintiffs have been awarded by the court five cents a pound on the number of pounds made by the Diamond Rubber Co., amounting to $130,000, $50,000 additional damages and $26,000 interest and costs, a judgment for $210,000. This is the case that was affirmed in March by the Circuit Court of Appeals in New York.

Besides the above, numerous suits were brought against other infringers, all of whom acquired licenses and damages against them were not pressed.

The plaintiffs in all these cases have been the Consolidated Rubber Tire Co. and the Rubber Tire Wheel Co. The name of the Consolidated Rubber Tire Co. was changed on January 1, 1914, to Kelly-Springfield Tire Co. It is the same company, its name having merely been changed by amending its charter.

A very large poundage is involved in the suits now pending, that of The B. F. Goodrich Co. approximating five and one-half million pounds.

Suits over this patent have been pending since 1896, the first being against the American Rubber Tire Co. of New York City, wherein the patent was adjudged valid. Then came the decision at Cincinnati adjudging the patent void, which afforded an excuse for infringers. But in 1906-7 the patent was adjudged valid by the Circuit Court of Appeals in Milwaukee, Wisconsin, and New York, and was finally adjudged valid by the Supreme Court of the United States April 10, 1911.

STANDARD PNEUMATIC TUBES AND TIRES.

A tire which is guaranteed for 5,000 miles must have behind it a responsible organization and a corps of experts in every stage of its manufacture. The Standard hand-made tire has such a guarantee molded right on the tire itself. The manufacturers' claims for superiority of these tires are that they are hand-made by experts, are full molded by a process original with them, at a temperature and pressure which produces a perfect cure. Fabrics and materials of superior quality are used in the carcass, and the rubber is carefully selected from uniform grades of the best quality. There is one ply more of fabric used in this tire than in some popular tires. The treads are of a specially tough rubber, the result of years of study, test and development. They are furnished both smooth and non-skid, the latter bearing a combination of the letter S, the initial of the company. It is the same story regarding inner tubes, pure Para rubber, extra thick, cured by slow vulcanization, extremely tough and heat-resisting. [The Standard Tire & Rubber Co., Hippodrome Building, Cleveland, Ohio.]

MIDGLEY COLLAPSIBLE CORE.

The novel method of making this core consists in stamping up a series of thin sheet steel plates that have been prepared so they will adhere to molten iron and casting them in the usual core sand mold. The sections are held in alignment by four plugs that occupy the bolt holes and are cast integral with the core. These are afterward drilled out, forming holes for the retaining bolts of the core, which is then machined in the usual manner.

The interlocking joint is strong and well designed to withstand the severe strain to which cores are subjected. The method of assembling the core by means of the interlocking joints and retaining bolts is very clearly shown in the illustration. [Thomas Midgley, 85 East Gay street, Columbus, Ohio.]

W. A. Kirkpatrick, formerly connected with the Philadelphia branch of the Hardman Tire & Rubber Co., Belleville, New Jersey, has been appointed manager of the branch at Baltimore, Maryland.

DREADNAUGHT TIRE & RUBBER CO. SALE.

The plant of the Dreadnaught Tire & Rubber Co. at Orangeville, Baltimore County, Maryland, was sold on April 12 at public auction to H. James Lepper, a member of the stockholders' reorganization committee who had been designated to make a bid on behalf of the committee. The price paid was $80,000, being the amount of the upset price fixed by the court. The sale will be ratified, unless cause to the contrary is shown, on May 18.

As indicated by its name, this committee intends to reorganize the business of the old Dreadnaught company and to continue the manufacture of tires at the plant.

THE PERFECTION TIRE ORGANIZATION.

The Perfection Tire & Rubber Co., which has a factory at Fort Madison, Iowa, a fabric plant at Wabash, Indiana, and is also purchasing a plant in California, and the Perfection Tire & Motor Co., of Canada, Limited, are under the same management. The latter company has purchased a plant at Guelph, Ontario. The tire plant of the Champion Auto Equipment Co. at Wabash, Indiana, is also under the supervision of the Perfection Tire & Rubber Co. All three companies have separate offices in the Marquette building, Chicago, Illinois.

LEE TIRE & RUBBER CO. EXPANDS.

Plans and specifications have been completed for a large new mill to expand the present plant of the Lee Tire and Rubber Co. at Conshohocken, Pennsylvania, and it is expected that this addition will be completed in three months' time. The new mill will be located 300 feet in the rear of No. 2 mill and will be two stories in height, 130 feet in length and 80 feet in width. The architecture will conform to the style of the other buildings, which are of the modern type of steel and concrete construction.

The new building will be used for the manufacture of miscellaneous rubber goods and hospital supplies, thus enabling the Lee company to materially increase its tire departments, enough space being available in the present plant to run the total output up to 2,000 tires per day.

TRADE MARK SUIT DISMISSED.

The suit for alleged infringement of trade-mark brought by the Pennsylvania Rubber Co. against the Dreadnaught Tire & Rubber Co. in the United States District Court at Wilmington, Delaware, was closed on March 23, when a decree was entered, dismissing the suit, the Circuit Court of Appeals sustaining the decision of Judge Bradford. The costs of the case were divided between the two parties interested.

VERDICT FAVORABLE TO TIRE COMPANIES.

In the suit of the Automobile Coöperative Association against The B. F. Goodrich Co., the Republic Rubber Co. and the Diamond Rubber Co., all of Akron, Ohio, the jury gave its verdict in favor of the tire manufacturers, and the judge strongly approved the verdict. This practically closes the litigation. Originally five companies were sued, but late in March the suit was dismissed against the United States Tire Co. and the Firestone Tire & Rubber Co. It may be remembered that the Automobile Coöperative Association was formed by automobile owners to buy tires and other supplies at wholesale. The companies refused to sell this association at the prices they sold to dealers. Hence the suit for "restraint of trade." It was proven that there was no combination in restraint of trade, each company acting independently.

COLORED STREAK TIRE TRADE-MARKS.

Among the rulings in regard to trade-marks, it is noted that "a red stripe or tread for rubber automobile tires is not to be rejected because of the prior registration of a blue stripe similarly used and apparently intended to suggest the name 'Blue Streak.' There is enough doubt of the similarity of the marks to pass the application for publication, and register it, if not opposed." We understand this application was by the Fisk Rubber Co.

TRADE NOTES.

The Marion Tire & Rubber Co., Marion, Ohio, has plans under way for a new automobile tire and tube manufacturing plant, to be equipped with the most up-to-date machinery. The building will be constructed of steel and concrete, fireproof throughout, 60x150 feet in dimensions, two stories and basement, with an additional power plant of like construction, 40 x 80 feet in size. The architect is Mr. Dobbins and the contractor, E. Elford, both of Columbus, Ohio.

The Walters Rubber Co. of New York, Inc., recently incorporated, has for its secretary and treasurer Howard S. Walters, for seven years connected with the United States Tire Co. as a salesman and for three years with the Federal Rubber Manufacturing Co., resigning April 1 to organize and manage this new corporation, which will have the exclusive distributing agency for Long Island for Federal tires and tubes, as well as marketing tires and tubes bearing the company's name. The general office of the company is at 54 Main street, Mineola, New York.

The Gordon Tire & Rubber Co., Canton, Ohio, has commenced the manufacture of hard rubber parts for use in the extensive line of druggists' sundries which constitutes an important part of this company's output.

The Victor Rubber Co., Springfield, Ohio, is erecting two new buildings, one 150x40 feet and the other 50x40 feet. These additions are made necessary by the increased pneumatic tire business of the company. The present production of the Victor company is 150 hand-made tires per day, and the entire plant is being worked with a night and day force.

The Perlman Rim Corporation of New York has acquired the automobile rim business of the Jackson Rim Co., Jackson, Michigan. Ground has been broken for an additional building with 40,000 square feet floor space.

The Western Union Telegraph Co. employs 8,200 messenger boys, it is said, and about 5,000 of this number use their own bicycles in delivering the company's messages. The increased cost of tires has added considerable burden to the upkeep of a wheel. In the future, however, the boys will be able to buy tires at wholesale prices, for it is announced that the company has made arrangements to supply tires at cost.

The Atlas Yarn Co., Globe Village, Massachusetts, recently incorporated with Fred L. Hewitt as president and Frederick J. Quinn as treasurer, has purchased the 16,000 spindle cotton yarn mill of the Hamilton Woolen Co. The mill is in full operation and the new concern intends to increase the output to include the manufacture of tire fabric yarn. Mr. Quinn, who will be the operating head of the new concern, is a practical cotton mill man, having been identified with the textile industry for many years.

Tires may last longer and motorists be less liable to accidents in New York state, now that the Slater bill has become a law. This makes it a misdemeanor to place an any road, highway or public place glass, tacks, nails or other articles which might injure an animal or person, or puncture a tire.

The United States Circuit Court of Appeals has decided that the name "Neverleak" applied to a tire fluid, the composition of which is secret, did not become public property upon the expiration of the patent because the tire fluid itself was never patented, and therefore the original owner of the preparation has the sole right to use this name on his goods.

An interesting computation of the cost of operating an industrial electric truck, as presented by C. E. Ogden, manager of the Walker Vehicle Co., gives as one expense 14 cents per day for tire renewals, or about 9 per cent of the total daily cost. The electric truck referred to is considered the logical successor of the ordinary hand truck used in warehouses, factories and railway terminals.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

A GOODLY percentage of all the automobile tires manufactured in the United States come from Ohio, and this State has come to the front so prominently in the manufacture of rubber goods that the suggestion has been made by an Eastern advertising agency to change its historic appellation, "The Buckeye State" to "The Rubber Plant State."

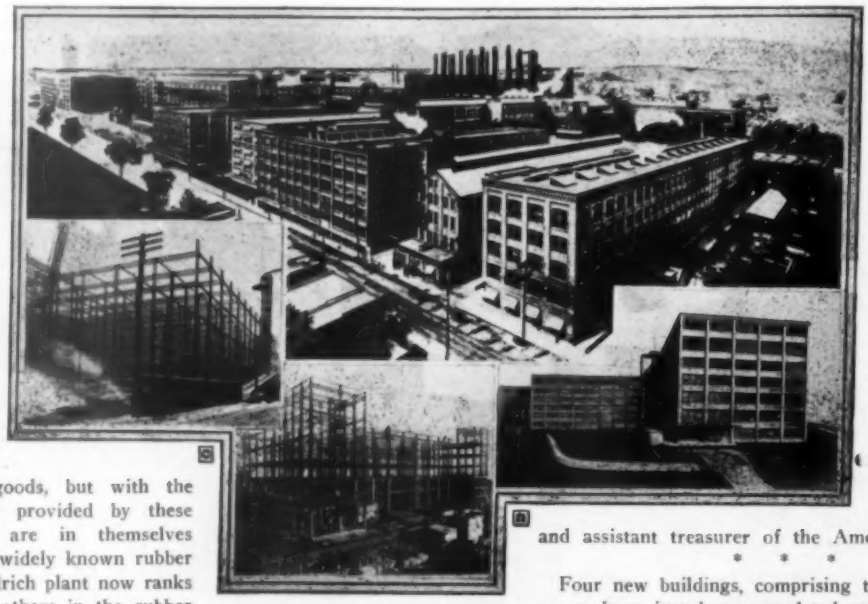
Men from all parts of the country are coming here, answering the call of the rubber factory boom. Over $2,000,000 is being spent to solve the housing problem.

The first of last month Akron was host to the Ohio State Automobile Association, and every rubber company in the city united with the Akron Auto Club in entertaining the delegates representing the automobile clubs throughout the State.

An addition to the Ohio Building, now in progress, will be occupied by the Akron City Club, 33 to 50 per cent of the membership of which represent various branches of the rubber industry.

* * *

The addition of three great buildings which are nearing completion will make the plant of The B. F. Goodrich Co. much the largest rubber factory in the world. Before these new buildings were erected the Goodrich institution was among the world's largest plants devoted to the manufacture of rubber goods, but with the increased capacity provided by these additions, which are in themselves larger than many widely known rubber factories, the Goodrich plant now ranks far ahead of any others in the rubber trade.



THE B. F. GOODRICH CO.'S PLANT.

An idea of the size of the Goodrich plant may be gained when it is said that the group of fifty-seven buildings have a floor space of nearly a hundred acres and that one would have to travel 3.8 miles to circle the grounds.

The largest of the new buildings is a finished goods warehouse, 320 feet long and 280 feet wide, with one wing six stories high and another of seven stories. This structure is nearly completed.

The second largest of the three new buildings is six stories high, 300 feet long and 100 feet wide. It will be used for manufacturing and storage purposes. The third is a building that will be utilized as a machine and pattern shop. It is five stories high, 260 feet long and 100 feet wide.

All the new buildings exemplify the latest ideas in factory construction. Lattice steel columns and girders encased in reinforced concrete are used throughout for the frame-work. Each of the buildings has concrete floors, brick walls and steel window-frames and sash. They are equipped with elevators and enclosed fire-escapes, and will have the same adequate sprinkling system that contributes to the safety of all the buildings which constitute the Goodrich plant.

* * *

The Akron Rubber Mold & Machine Co. has built a 60 x 115 feet addition to its plant and has also taken over the building formerly occupied by the Lincoln Rubber Co. and purchased the property used by the Woodruff Novelty Co. New machinery is being installed, and the company expects to more than double its capacity. The Lincoln company building will be used for the vulcanizing tire repair department of the Akron Rubber Mold & Machine Co., this department of its business having more than tripled in the last year.

* * *

The Firestone Tire & Rubber Co. is adding a fifth story to its entire plant.

Sherman L. Lewis has been placed in charge of sales promotion by the Firestone company. Mr. Lewis was formerly with the Niagara Lithograph Co. and also in charge of trade aid work for the Remington Arms-Union Metallic Cartridge Co.

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The recently reorganized American Tire & Rubber Co., making tires, tubes and accessories, is installing new equipment to meet increased demand. On April 15, a liability contracted by the old company amounting to $50,000 in mortgage bonds, matured and was taken care of by the present organization, whose personnel was given in the March issue of THE INDIA RUBBER WORLD. H. L. Houck, previously identified with the Firestone Tire & Rubber Co., and more recently with the Swinehart Tire & Rubber Co., is the general manager and assistant treasurer of the American company.

* * *

Four new buildings, comprising ten acres of floor space, have just been completed at the plant of the Goodyear Tire & Rubber Co. One is a three-story "L" shaped building, 180 x 160 feet, for the solvent department. An eight-story building, 300 x 80 feet, will be used for raw material and manufacturing, and two other buildings, each seven stories high and about 200 x 60 feet in dimensions, are for general manufacturing purposes. In addition, the Goodyear company has under construction, to be completed the first of next year, a crude rubber and manufacturing building comprising 275,000 square feet of floor space; a reclaiming plant, 200,000 square feet; a warehouse, 250,000 square feet; mechanical goods building, 280,000 square feet; a new power house and addition to the main power house of 12,000 horse-power; a garage, 25,000 square feet, and additions to the general office, 40,000 square feet.

The authorized capital of the Goodyear company has been doubled from $25,000,000 to $50,000,000, to take care of a 100 per cent dividend on common stock and a new issue of preferred stock to replace the present issue, retired by redemption.

George H. Pickerell, United States consul at Para, Brazil, has been visiting F. A. Seiberling, president of the Goodyear company, having come to Akron for the purpose of interesting the rubber concerns in the development of the Para rubber industry.

* * *

The Swinehart Tire & Rubber Co. is turning out a new motorcycle tire with a tread of special non-skid construction.

The Biggs Boiler Works is building a brick addition, 100 x 125 feet, to its plant. This will include new offices for the company.

* * *

The additions to the plant of the Miller Rubber Co., mentioned in a previous issue, are progressing rapidly.

J. B. Bleiler, formerly connected with the Diamond Rubber Co. and more recently vice-president of the Overman Cushion Tire Co., is now in charge of the truck tire department of the Miller company.

* * *

Frank Robinson, crude rubber dealer of New York City, has opened an Akron office in the Second National Bank building.

* * *

H. H. Henderson, Akron manager for Henderson & Korn, crude rubber dealers, New York City, has recently returned from a sojourn of several weeks in Cuba.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

THE rubber trade continues active in most lines. Clothing people have all the business they want for the present, but are making up new samples to show on the road early in the summer, when it is expected that even the large orders they now have on hand for fall delivery will be increased by further orders and supplementary ones. Boot and shoe manufacturers are fully supplied with orders and their factories will be kept busy until the usual summer shut-downs, and we understand that there is doubt about such shut-downs being any longer than is actually necessary to make repairs and alterations before starting anew on later deliveries. Mechanical goods people have had only moderate demand for hose. Evidently many of their customers are fairly well stocked because of the poor trade in this line last year. In belting, however, there is an added demand, evidently because of the scarcity of leather suitable for belting and its consequent high price. Druggists' sundries and molded goods people have a fair amount of business and are not complaining. The manufacturers have all their factories can attend to. Taken altogether, the trade is in a most satisfactory condition in every branch.

* * *

The double fabric which has gone into the first dirigible which has just been completed for the United States Navy was sheeted and cemented at the American Rubber Co. factory at Cambridgeport, and the factory is still manufacturing similar fabric on orders. The demand for carriage cloth is so heavy as to tax the facilities of this Cambridgeport factory and some similar goods are now being manufactured in Naugatuck, and it is hoped soon to add this line to the output of the Stoughton factory of the company.

* * *

Judge Morgan, in the United States District Court on April 12, allowed the motion to quash the indictment against Warren B. Wheeler and Stillman Shaw on the ground that the independence of the grand jury which indicted them had been seriously interfered with by the prosecuting officer of the United States Government. Readers of THE INDIA RUBBER WORLD are familiar with the case, whose progress during the last four years has been reported in previous letters. It now seems that the reason for thus finally disposing of the case, was because of the action of the Assistant Attorney General, who directed the grand jurors not to indict another party at the same time Messrs. Wheeler and Shaw were indicted. Judge Morgan holds that the attorney's conduct amounted to improper interference with the rights of the grand jury and that this interference directly affected its decision. He further says:

To uphold what was done by the prosecuting officer in this case is in effect to establish his right to direct the grand jury not to indict a person whom the grand jury had voted to indict. It would make a great inroad on the independence of the grand jury and one of peculiarly dangerous character.

It is hard to conceive of a plainer case of undue interference by the prosecuting attorney than shown by the evidence here. As the indictment returned was directly affected thereby in a substantial particular, it seems to me both upon principle and upon the authorities that it must be quashed.

* * *

Lester Leland, vice-president of the United States Rubber Co., and Mrs. Leland, are now on a trip to California.

* * *

George Wyman, assistant office manager of the Hood Rubber Co., gave a very instructive lecture on the gathering and shipping of rubber, and manufacture of rubber goods before the Shoe and Leather Class of the Boston Continuation School on the occasion of the graduation of that class on March 24. The lecture was profusely illustrated with lantern slides from negatives taken by Mr. Wyman, who is an expert photographer.

* * *

The United States Tire Co., at its New England branch on Commonwealth avenue in this city, celebrated Tire Show Week, the third week in April, the exhibition and management of the entire affair being in charge of E. H. Kidder, the manager of this branch. Fine window displays were shown on the two sides of the wedge-shaped building, which included artistic arrangements of the various tires which are made by this company, together with samples of the crude rubber from which they are made. Facing the front door was a life-sized cut-out of a man rolling a tire toward the visitor. The tire was a real one and the man, although made of cardboard, was so realistic that invariably people dodged out of his way when entering the door. Mr. Kidder and his assistants were present to explain the advantages of their specialties, "Royal Cord," "Nobby," "Chain," "Usco" and plain tread tires. That the affair was a success was proven by a large number of visitors who took advantage of the invitation to attend the exhibition, and I understand the result shows up splendidly on the sales books at Mr. Kidder's office.

E. H. KIDDER.

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A man having the appearance of being an Englishman called upon a rubber man in this city early last month and introduced himself as Mr. Bridge, a brother of two members of the firm of David Bridge & Co., Limited, well-known engineers and millwrights of Manchester, England. He reported that he had just come from Montreal, was in poor health and had been relieved of his money on the way. He needed to go to New York and borrowed a small sum to take him there, promising to return the loan on arrival. His failure to do so induced the lender to write a letter to the Messrs. Bridge, who replied that the man was an imposter and that no member of their family had been in New York since 1912. As the Messrs. Bridge have a large clientele among the rubber trade in this country, your correspondent feels impelled to notify the trade that they may be on the lookout and not be mulcted by the same story.

* * *

Many of the members of the rubber trade are well acquainted with Arthur D. Little, former president of the American Chemical Society. Although Mr. Little's special work has been more in the line of cellulose than rubber he was intimate with Dr. Weber and other rubber chemists and familiar with the trade. Mr. Little has been retained by the Canadian Pacific Railway to establish a central organization for research work in Montreal to carry out Lord Shaughnessy's proposal for a scientific investigation of Canada's mineral, metal, hydro-electric and chemical resources, and to stop waste in forests, mines and mills. This will be known as the Canadian Research Bureau, and its discoveries will be given out in bulletins to merchants and manufacturers.

More than 1,000 persons gathered at the plant of the Monatiquot Rubber Works Co. in South Braintree on Patriots' Day, to attend the flag raising in honor of the sixth birthday of this company. Treasurer James H. Stedman was master of ceremonies and addresses were made by Calvin Coolidge, Lieutenant-Governor of Massachusetts; Grafton D. Cushing, former Lieutenant-Governor; Division Superintendent F. S. Hobbs, of the New York, New Haven & Hartford Railroad, and State Senator Langelier, a member of the Massachusetts Prison Commission. The program included a fine luncheon, which was served to the invited guests, among which were many state, town and corporation officials and prominent citizens. Music was rendered during the afternoon by the Stetson Shoe Band. The entire works were then thrown open for inspection. They were in full operation, and the visitors inspected the different processes used in manufacturing "Naturized" rubber, the product of this mill. Many congratulations were received by President Harlow, Sales Manager Turner and Treasurer Stedman on the progress which has been made by the company in its six years of existence here, and the whole affair was most successful.

* * *

In this connection it may be of interest to note that President Robert C. Harlow, of the Monatiquot Rubber Works Co., has been appointed the first Fire Commissioner of the historic old town of Plymouth in this State, the town having voted to change from the old system of a board of fire engineers and give one man, as fire commissioner, full charge of the department. Mr. Harlow had been a member of the water board of that town and was one of the town committee named to report on a more efficient fire department. His extensive business experience should prove valuable in the work which he has undertaken for his home town and Plymouth is to be congratulated upon acquiring his services in this important department.

* * *

In the Boston letter last December mention was made of the purchase of land by parties who proposed building a rubber factory near Maplewood Station. This has materialized in the incorporation of the Fellsway Rubber Co. with an authorized capital of $95,000, of which $30,000 is paid in cash, for the manufacture of mechanicals and molded goods, including rubber soles and heels for the shoe factory trade. F. P. Gowing, of the shoe supplies firm of H. H. Kelley & Co., Boston, is the treasurer, whose office is at 230 Purchase street, Boston. Louis H. Williams, who has had a wide experience in the manufacture of molded goods in Scotland and Canada and this country, is president, and will have charge of the manufacturing end of the business. His office will be at the factory, which is situated at 30 Locust street, Medford, Massachusetts.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE rubber factories continue to be among the busiest manufacturing plants in Rhode Island, and additional orders are being constantly received, notwithstanding that practically all of the concerns have more demands on their books than can be filled for some months to come. Many of the departments are, and have been for many weeks, working on overtime schedules and there would be even more machines operating in double shifts if there were men and women in sufficient numbers to work on them. There is not a single plant in the State that has enough help, it is said, and while improvements are being made in machinery and methods, it is not known where the extra help that will be needed is to come from, as repeated advertising in the newspapers fails to bring any material response. This shortage of help, together with the freight embargoes which are still in force to a greater or less extent, and some slight labor controversies, have somewhat handicapped the manufacturers, but these, in a measure, are adjusting themselves, and it is believed that the year 1916 will be written into the history of the rubber industry of the State as one of the most prosperous ever experienced.

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With all the hustle and bustle incident to rush orders under far from favorable conditions and circumstances, however, the welfare of the operatives has not been overlooked or neglected. Rubber manufacturers as a rule have been prompt in taking advantage of every opportunity to better the working environment in their plants. The Woonsocket Rubber Co. maintains a fully equipped hospital for all emergency purposes, and a rest room that was established at the Alice Mill, at Woonsocket, early in 1915, and later similar accommodations were provided at the Millville plant. Miss Essie McDonald, a trained nurse, is on duty at the Alice Mill in the morning and at the Millville plant of the company each afternoon. She has full supervision as regards the health of the employes in both of these mills.

* * *

The most extensive welfare work done in Rhode Island in any industry, is that carried on at the National India Rubber Co.'s plant at Bristol, involving the expenditure of $10,000 on one item alone, with a good many more thousands of dollars in the aggregate, and yet the plans are not fully developed. For a number of years there has been a steady effort made on the part of the National company to improve working conditions and to bring the operating force up to a high standard. Owing to the serious lack of housing accommodations, many of the employes reside elsewhere, not a few as far away as Providence and Fall River. For other reasons, it has often been necessary to hire persons almost as they stepped off the ocean liners in New York, few of whom had the remotest conception of hygiene.

The first problem in welfare work, therefore, was cleanliness, essential because of the character of the output. To obtain this there was a vigorous campaign waged, to the extent that in every department where white goods are handled personal neatness is now apparent.

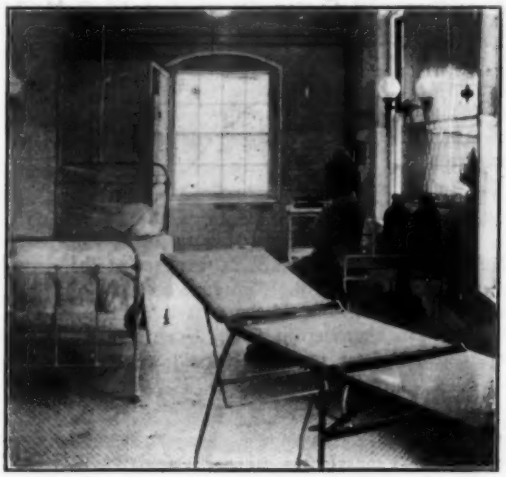
The second step was to obtain satisfactory sanitary conditions, and for these it became necessary to give notice that spitting on the floor would be followed by instant dismissal—this was to prevent tuberculosis infection. Inspectors were employed who could speak the various languages, and personal notice was served upon every employe that this rule would be enforced to the letter, and now the rule is rarely broken.

DISPENSARY AND REST ROOM AT THE NATIONAL INDIA RUBBER CO.

New, up-to-date toilet accommodations were provided in a

modern three-story building erected contiguous to the workrooms, connections made by means of winding iron stairways, and additional fire escapes thus provided.

The next feature taken in hand was that of the hospital. This was located off the calendering room, where the liability of accidents is the greatest. It is finished in white, with tiled walls



SURGEON'S OPERATING ROOM AT THE NATIONAL INDIA RUBBER CO.

and floor, and equipped as an operating and emergency service room. On the second floor of the upper building, midway between the shoe and stitching room departments, where most of the girls are employed, is a cheerful rest room, in which there are two beds and a medicine cabinet. It is here that Miss Ruth Graham, a graduate nurse, who has general supervision of the health of the employes, has her headquarters.

Inability to provide suitable homes for expert sewers, has handicapped the company in obtaining the services of a sufficient working force. To overcome this trouble in part, the company took over the D'Wolf Inn, expending more than $10,000 on repairs and for suitable heating and toilet arrangements, and opened this as a boarding house in April, 1915. As nominal board only is charged, the Inn is run at a loss. At present there are about 60 boarding at the Inn. The company has contributed a phonograph, but the girls pay for the hire of a piano. There are nights of reading and dancing and a competent instructor is training a class in gymnastics that the girls themselves have formed.

Following suggestions of those interested in welfare work, the company has installed a very expensive ventilating system for the workrooms and widened the passageways in, and those connecting the buildings, to a uniform width of 25 feet, thus providing for easy exit should there be occasion for hurried leaving of the shops.

The work of fitting up one of the rooms as a restaurant and lunch room for the employes has recently been finished, and good food is now being served at moderate prices. It is also proposed to fit up a room for recreation purposes, where the female operatives may enjoy themselves during the noon hour. This will be done as soon as accommodations can be obtained, and this may result in the construction of a special building for this purpose, as every foot of space now available at the plant is needed for manufacturing purposes.

In common with all the plants of the United States Rubber Co., the Revere Rubber Co. maintains a safety committee, composed of manager, master mechanic, superintendent and two others, which safeguards the employes from injury by applying protective devices to all machinery. It also looks after sanitary conditions and everything else that will conduce to the comfort and advancement of the help. Special welfare work is done among the girl employes, individual drinking cups are provided, and a rest room is maintained. There is also a hospital, in which first aid is given minor injuries antiseptically treated. It is intended to place this work in charge of a trained nurse in the near future, and to establish a recreation room. No lunchroom is provided, for the reason that it is required that all shall leave the premises at noon, that the rooms may be thoroughly ventilated and conditions for the afternoon work made better. Tennis courts are maintained for the free use of the employes during the noon hour.

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I. Victor Stone, chief chemist at the Revere Rubber Works, Valley street, has taken possession during the past few days of the new laboratory that the company has recently finished in addition to its plant on Eagle street. This addition is said to be one of the most complete and up-to-date of its kind in the country.

* * *

The Washburn Wire Co., of Phillipsdale, has begun dredging operations in the Seekonk river, preparatory to the building of a dock at the plant. In the past the company has received its water shipments from a dock owned by the American Electrical Works. This method has entailed much handling, which will be eliminated when the proposed wharf is completed. Other improvements are being made or are in contemplation at the plant of the Washburn Co., and will be commenced at an early date.

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Julian A. Read, of this city, has been appointed executive secretary and accountant of the Kansas City Tire and Rubber Co., at Kansas City, Mo., and will make his headquarters there with P. A. Werner, organizer of the concern. The concern has also recently taken over a plant at Chester, West Virginia, which is to be a subsidiary.

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Edward L. Viets, of Detroit, State agent for Michigan for The B. F. Goodrich Co., was a recent visitor in this city in the interests of his concern.

RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

THE demand for automobile tires is reported as unprecedented in the local factories. It is estimated that more than eight hundred thousand tires will be turned out before the coming season has closed. The total payroll of the tire manufacturers is now $3,000,000 a year. This sum will be considerably increased, according to plans under way for next season. One factory will fall 10,000 tires short of filling the orders it has already booked.

It is possible that some of this business is due to users anticipating their tire wants in view of the expected increase in prices in the near future, but, in the main, it is but the reflection of a normal healthy growth. One Trenton firm by working every department to capacity on day and night shifts has been able to get ahead of orders, and it is said this company has made up several carloads of tires which have been placed in storage. These will be held for the better prices which will undoubtedly be obtained within the next few months.

Zinc oxide, it is said, will be at a much higher figure within a few weeks and at the present rate of increase the price will be almost prohibitive in mid-season if the present war conditions continue. Red oxide of iron is being substituted for antimony as a coloring agent for red tubes and tires, but even this is becoming steadily more scarce and it looks as though the gray product will have the call almost exclusively.

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Among the concerns filing charters with the Secretary of State in April is the Dayton Tire Co., of New Jersey. Head-

quarters, Newark. The concern, as the name indicates, is to manufacture automobile tires. Accessories will also be turned out. The capital stock is $10,000. The incorporators are: Nathan Schwartz, Belleville; Fred D. Rausler and I. G. Farmer, Newark.

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The Trenton Chamber of Commerce is negotiating with a company of New York capitalists who are considering the advisability of locating a factory here for the manufacturing of a popular-priced car, not yet on the market. The names of the promoters are being kept secret pending the negotiations.

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Finishing touches are being put upon the $20,000 addition to the plant of the Thermoid Rubber Co.

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Samuel McDonald, who resigned his position as salesman for the Acme Rubber Manufacturing Co. some time ago to open a tire salesroom in Trenton, has again taken a position with the Acme.

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The Zee Zee Rubber Co., which has begun the making of "Brazilian" tubes in its new plant at Yardville, a few miles south of Trenton, has already seen the necessity of practically tripling the present capacity of the plant by additional buildings, although the mortar has scarcely had time to dry in the plant now occupied. The new addition will be erected at once.

NEW FACTORY OF THE ZEE ZEE RUBBER CO., YARDVILLE, NEW JERSEY.

The story of the Zee Zee Rubber Co. is interesting. About eleven years ago Irvin Zimmerman, the president of the company, was a banker and broker in Philadelphia. He determined to go into the automobile tire business and formed a selling company with his brother as a partner. Their original stock of tires, made under their brand in a Trenton factory, was worth about $3,000. Such was the beginning. When it is stated that last year this company sold $1,500,000 worth of tires and didn't even have its own factory, the statement will probably be rated as remarkable. But it isn't so remarkable when one knows Irvin Zimmerman, a man who fairly radiates "pep" and who gives the impression that he could start a garage in Venice and get rich at it. He is a born salesman, and under his business methods the Zee Zee output is sold far into the future. There are now 400 branch salesrooms for the Zee Zee tires and tubes. About 60,000 autoists are regular users.

The company expects to be making tires in its own plant by July. According to the plans of the concern, 3,000 tubes and 800 tires a day will be turned out when the new building is completed and all the machinery installed, and 180,000 feet of floor space will be occupied.

The Detroit, Michigan, office of the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, formerly at 1201 Woodward avenue, has removed to 1109 Kresge building.

WESTERN TRADE NOTES.

THE Southwestern Tire Manufacturing Co., whose incorporation was noted in the April issue of THE INDIA RUBBER WORLD, has secured a factory site in Oklahoma City, Oklahoma, and will begin the construction of its plant this month. The officers of this company are as follows: John L. McClelland, president; Charles W. Gunter, vice-president; W. E. McClelland, secretary, and C. H .Everist, treasurer.

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The Denver, Colorado, branch of the Fisk Rubber Co., Chicopee Falls, Massachusetts, has been removed from 1635 Broadway to a new building at 1168 Broadway, constructed with large space for service use.

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A. L. Devault, formerly manager of the Detroit, Michigan, branch of the Federal Rubber Manufacturing Co., of Illinois, has been transferred to Chicago as manager of the central district, with headquarters at the Chicago Warehouse, 1434 Michigan avenue. Mr. Devault entered the rubber business in 1905, with the G. & G. Tire Co., Detroit, finally being given charge of that branch, and still later becoming special representative for the United States Tire Co.

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J. G. Smith has been appointed manager of the Dallas, Texas, branch of the Pennsylvania Rubber Co. of New York. Mr. Smith has been connected with the Pennsylvania company for the last eight years, being, for the past three years, with the selling organization at the Atlanta, Georgia, branch.

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J. W. Wildman, formerly with the New York branch of the Portage Rubber Co., Akron, Ohio, has been made manager of the branch at Des Moines, Iowa.

* * *

The United States Rubber Co., Detroit branch, is the name now given to the consolidation of two branch stores of this company which were previously known as the Detroit Rubber Co. and the Hub Mark Rubber Co. This concern will continue at 81 and 83 Jefferson avenue, carrying the lines formerly carried by both branches. There will be no change in the management, both A. H. Crum and J. C. Huff being connected with the agency.

* * *

O. S. Johnson has been placed in charge of sales and service in Detroit, Michigan, as branch manager for the Gibney Tire & Rubber Co., Conshohocken, Pennsylvania; H. L. Winter, formerly Detroit branch manager, having resigned. Mr. Johnson was formerly with the United States Tire Co. as district manager.

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The Banigan Rubber Co. and the Standard Rubber Shoe Co., Chicago, Illinois, have consolidated, operating under the latter name, with J. J. Hawkins as president and E. C. Yarnell as treasurer.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

BUSINESS at the works continues brisk, both for government account and private orders, but the all-absorbing topic is how to get the work done with the continual withdrawal of men for military service. Comparatively few of the applications to the tribunal for the total exemption of men have been granted and works managements have been compelled to fall back more and more upon the services of women. With regard to this change, the managing director of a large works tells me that the effectiveness of the substitution has been an eye-opener to him, more particularly with regard to the volume of work turned out. In fact, it seems to be the general result that women have proved efficient in the various forms of manual labor to which they have been introduced for the first time, while the results have been by no means so satisfactory where they have replaced men in office and other clean-hand work, this being probably accounted for by the fact that the recruits come from somewhat different social strata.

THE NEW BUDGET DISAPPOINTING.

The new budget is mainly of home interest and, much to the disgust of fervent tariff reformers, there are no new import duties, which are naturally the main interest for foreigners. The considerably increased duties on motor cars, coupled with the market rise in the price of petrol, will probably have some effect, but not much on the demand for tires, pleasure motoring having fallen off already to a great extent. The value of tires, tubes and accessories for motor cars imported from America from October 1 last to February 29 is stated officially to be £912,397 plus £4,365 for motorcycle tires. It will be remembered that the import duty proposed in the last budget on these goods was abandoned, though it was retained on motor cars. Ford motor cars, which formerly paid a license of £6, will now have to pay £18 under the new budget.

BELTING QUALITIES CRITICISED.

The old controversy as to the respective merits, as regards strength and longevity of Brazilian Para and plantation Para, was renewed in the discussion of Mr. Tinto's paper on rubber and balata belting before the Manchester Association of Engineers. Mr. Bentham expressed the opinion that the rubber belting of 30 or 40 years ago, made from wild rubber, could not be obtained today, because plantation rubber was being used in place of the Brazilian rubber, which was now practically exhausted. Quite probably the speaker was correct in saying that the average rubber belt, as indeed the average compounded rubber article, is not today equal to what was obtainable in earlier days of the manufacture before competition among makers became keen, but this matter of belting is not one in which the relative lasting values of the two rubbers can be summarily determined without careful consideration of many details of the manufacture, and I have reason to suppose that this view is supported by the author of the paper. Mr. Bentham, I may say, is an engineer of wide experience and holds an important position, but he is not a rubber manufacturer. With regard to the statement that the wild rubber of which belts were formerly made is now practically exhausted, if this is meant, as is presumably the case, to refer to Fine Hard Para, I fancy that our friends in Brazil would be inclined to disagree.

GARMENT WORKERS' WAGES INCREASED.

An agitation among waterproof garment workers in the Manchester district for an increase of pay has led to the increase being granted in practically all cases. This branch of the trade remains fully employed, and it would be a serious matter if any stoppage occurred. At the same time, although the manufacturers have perforce all come into line, it must not be assumed that they all see, eye-to-eye, the necessity for, or advisability of, this concession.

A QUESTION OF HONESTY—OR ETHICS.

Some time ago I referred to the sale in one shop of "The Kleenquick" eraser, made entirely of substitute and mineral matter. I must say that it answers its purpose very well and does not get soiled on the rubbing surface as does ordinary india rubber when left lying about. A question of ethics, however, arises in the sale of it as india rubber, as it has come to my knowledge that compositions of the sort are supplied to buyers at shops who ask for a piece of rubber without any explanation as to the fact that it is not india rubber. The problem is a knotty one because it would doubtless be easy to show that various goods supplied as made of rubber, have frequently contained that substance in but infinitesimal quantities. It might be argued successfully that as it rubs out pencil marks with ease and completeness, the buyers' expressed wants are filled, despite the fact that the composition is different from what has been supplied in the past.

SHORT TRADE NOTES.

It is one thing to get out plans for the extension of works and another to get the work done in these days of labor shortage. Thus it is not surprising that delay has been experienced at the large new works of the Dunlop Rubber Co. at Bromford, near Birmingham. Another firm whose large extensions are making but slow progress is the Premier Waterproof & Rubber Co., Limited, of Danzig street, Manchester.

J. V. Worthington, general manager of the Dunlop Rubber Co., has been appointed a director both of this company and the parent tire company in place of Sir W. G. D. Goff, Baronet, one of the original Irish directors, who has retired from business. The new director is a qualified medical man who took the somewhat unusual step of leaving the profession to go into commerce, where he has been a recognized success and proved popular with the large numbers under his control.

Among the alien enemy companies recently wound up by government order is the Continental Tyre & Rubber Co. (Great Britain) Limited, South Kensington, London, and the Polack Tyre & Rubber Co., Limited, Shepherd's Bush, London.

The vulcanite manufacture has been taken up, as regards various articles, by several rubber manufacturers, and an extension of the home manufacture is to be seen in the case of certain firms using vulcanite in their businesses. For instance, a large firm of tobacco pipe manufacturers, who, when former supplies of vulcanite from Germany were cut off by the war, got its requirements filled by home manufacturers, though at a considerably higher price, has installed machinery made by one of our leading rubber machinists and is now turning out its own vulcanite.

A novel contract has been made between the Bradford Tramways Committee, Bradford, and the Dunlop Rubber Co., Limited, Birmingham. The latter agrees to furnish rubber tires for railless street cars for two years from February, 1916, at .75*d* [1¼ cents] per mile run per vehicle.

Your correspondent has been informed that an item in the February issue of THE INDIA RUBBER WORLD regarding a position of commercial manager at the works of the Leyland & Birmingham Rubber Co., Limited, Leyland, England, was incorrect. The position, which was made vacant by the death in active service of Lieutenant Colonel Fallows, has been filled by the

appointment of George Anderson, a departmental director of the company and formerly joint manager of its Glasgow business.

The British Board of Trade is in receipt, through the Foreign Office, of information to the effect that exportation from Norway of all manufactures of rubber, gutta percha and balata is prohibited, with the exception of driving and transmission belts of balata and gutta percha.

ANTI-RUST INNER TUBE.

The Stepney Spare Motor Wheel, Limited, London, has introduced on the British market a new type of inner tube for automobile pneumatic tires consisting of an ordinary air tube having around its inner circumference, where it is slightly thicker than th tread, a band of rubber which it is claimed prevents the rust from the rim injuring the rubber tube. It is also well suited for use on wire wheels owing to the fact that its shape before inflation protects it from damage by the spoke heads when being fitted in the casing.

Another feature of this tube provides what is termed a "tropical" joint, which, before curing, is treated with special solution and is claimed to be thus rendered immune from overheating when in use.

RUBBER EAR PLUG.

Though very similar in some respects to the ordinary ear protector, this recent invention has several novel features to command attention and interest. In the illustration on the right the protector is to be seen by itself, while on the left it is shown as it appears when fitted to the ear.

The plug or protector consists of a ball *A* made of flannel, silk or rubber, slightly tapered to fit the outer ear passage. This plug is attached to the end of the small screw *C* that is set at an angle of 45 degrees and threaded through the anchor piece *B*.

When the plug is in place the screw is turned by the milled head, which causes the plug to move both forward and sideways to suit the size and shape of the ear. Thus it can be adjusted to fit any ear, whereas other ear plugs must be made to fit each different size of ear. A cap of vulcanite, celluloid or rubber is used to cover the plug. A ball made of vulcanite, celluloid or rubber may be used in place of the flannel, silk or soft rubber. [T. N. Atkinson, 26 Hart street, Holborn, London, W. C., England. British patent No. 4,579 (1915).]

BRITAIN PROHIBITS AUTOMOBILE IMPORTS.

At a meeting of the privy council of Great Britain, King George signed a proclamation prohibiting the importation of automobiles, motorcycles and various other articles. This prohibition has been expected for some time, and is understood to be for the purpose that shipping may be free to carry necessaries for which the need is urgent. It is pronounced in logical sequence to the imposition of the 33⅓ per cent duty placed upon automobiles by the British government last October. It is understood that the prohibition does not apply to motor trucks or vehicles to be used solely for commercial purposes.

NEUTRAL EUROPE NEEDS TIRES.

Diplomatic representatives of the United States in Holland and Scandinavian countries have brought to the attention of the state department the difficulties encountered by automobile dealers and users in those countries, through shortage of tires. The agreement between the British Government and American manufacturers of rubber goods has resulted in forcing the automobile and tire dealers to buy all their tires through British dealers, and this has caused greatly increased prices, and in some cases inability to purchase tires at any cost.

THE SITUATION IN FRANCE.

By Our Regular Correspondent.

THERE is little to report from this country that would be of real interest to readers of THE INDIA RUBBER WORLD. We are all heart and soul in the war, our thoughts are on Verdun which is successfully resisting the most formidable, the most terribly scientific and powerful onslaught that ever was waged in war. A gigantic struggle like this is consuming tremendous quantities of rubber goods, tires especially. Practically all ammunition en route to the battle front and all the men traveling to and fro from the fighting lines are transported over great distances by vehicles equipped with rubber tires. The motor car has revolutionized warfare. Railways no longer have the importance they had in the great wars of the past. Motor trucks on our roads can do all that the railroads can and much more. We have solved the tire problem and are now obtaining very good mileages from the solid kinds which gave much concern at the beginning of the war. Our greatest motor-truck troubles of late have been with anti-skid devices on which there is much room for improvement. All our military trucks are provided with non-skid devices but they unfortunately are often lost just when they are required. The work of fitting non-skid chains is not easy when the man has but little experience and the thermometer is a dozen degrees below zero. Then, frequently, when the chauffeur endeavors to apply his non-skid chains he finds them perhaps a foot too short or too long. Drivers are reluctant to use non-skid chains but many have learned by experience that it is costly to do without them.

THE TIRE INDUSTRY.

Our rubber manufacturers are still able to supply our civil and military demands in the way of tires, as well as a fair portion of the requirements of our Allies. Only recently the Société des Etablissements, Bergougnan, Clermont-Ferrand, secured a contract for 25,000 solid rubber truck tires for the Italian Government and is now working on this important order having increased its manufacturing capacity to more than 900 solid tires per day.

SPORTING GOODS.

Business in rubber balls and sporting goods continues to be fairly good, thanks to the efforts of our athletic associations and publications. The army has been kept well supplied with these healthy means of recreation. Football matches are organized weekly and a large portion of the gate receipts are devoted to purchasing balls for the troops. The Paris representative of the American firm of A. G. Spalding & Bros. has been conspicuous in donating footballs, each to be used for one match and then turned over to the army. At a recent match in Paris a rugby football team of the American Ambulance, in Neuilly, was opposed to a team made up of available first-class players of Parisian clubs, and a goodly sum was raised for purchasing sporting goods for the soldiers.

SYNTHETIC RUBBER.

Our rubber men have followed with interest the writings of the German press on the subject of synthetic rubber and the progress alleged to have been made towards the solution of the problem. Of course we are skeptical when we read that the problem has been solved, and we have good reasons to be so. Writing on this subject your Paris contemporary "Le Caoutchouc & la Gutta-Percha" makes a few pertinent remarks, saying in substance: "They claim that a factory in Frankfort is making pneumatic tires from this new material which is sufficiently durable to be used for the same purpose as natural rubber. The process is secret, but Professor Memmler, of Berlin, says that the product is the result of several years experimenting and that it is satisfactory.

"In the course of the past seven or eight years, we have been asked on an average twice each year, to publish a statement

similar to this. In the present instance, we have no information other than that contained in a general article prepared for the press, giving no details of the process. Usually in such announcements, particular stress is laid on the low cost of production of the synthetic product, and it is worth while to note in this connection, the omission of all reference to the cost of production.

"Synthetic rubber is not a new discovery; it can perfectly well be made in a laboratory, but its production on a commercial scale has not yet been attained.

"It is evidently quite possible for a process to be economical in war time when one has to pay 21*s.* per pound for natural rubber, while the same process could not be countenanced in time of peace. The allusion to several years experimenting may merely indicate the development of one of the well-known patented processes.

"Another point worth noting is the indication concerning the lasting quality of this rubber; it is 'sufficiently durable,' etc. If all difficulties had been overcome a more energetic term would certainly have been used."

PERSONALS.

Baron de Wissocq, head of the Etablissements Hutchinson, serving as captain in the army, has been promoted to the rank of major and made Knight of the Legion of Honor.

Count R. de Fleury, a well-known rubber authority and contributor of your contemporary "Le Caoutchouc & la Gutta-Percha" is serving as a lieutenant of artillery.

Captain Rouxeville, the noted rubber chemist, recently returned to the front after a rest necessitated by wounds suffered in battle.

André Dubosc, chemical engineer and authority on rubber manufacturing, has returned from an extensive American trip.

TRADE NOTE.

Rousselot & Cie, Paris, manufacturers of chemicals, are installing a plant that will produce 220 pounds of golden sulphuret of antimony per day.

ACCUSED OF TREASON.

The barbarities in the Putumayo district are again brought to mind by the arrest and incarceration of Sir Roger Casement, who is now in military custody, having been captured when a German auxiliary was sunk, which was attempting to land arms and ammunition in Ireland for use against the British Government.

It was in 1910 that the stories were published of horrible atrocities perpetrated on the rubber gatherers in the Putumayo district in South America. Sir Roger Casement was then Consul-General at Rio Janeiro, and the British Government sent him to investigate the truth or falsity of the story. After spending several months in the interior, he reported that the accounts of the barbarities were not exaggerated.

After years of service in the British Government, holding offices of honor and responsibility, and having been knighted and having bestowed upon him medals and decorations, it is alleged that he has endeavored to arouse the hatred of the Irish, and that he has conspired with Germans against Great Britain.

HOLLAND.

The offices of the Amerikaansche Handelmaatschappij, conducted by J. Polak Grödel, in Amsterdam, representatives of the United States Rubber Co., Everlastik Inc., and several other well-known firms, have been removed from their old location—Prinsengracht 544—to new quarters at Marnixstraat 402A, in the same city.

Owing to the shortage of rubber in Germany, it is stated, on the authority of the managing director of a large rubber company who returned recently from Berlin to Stockholm, that nearly all the taxicabs in Berlin have steel tires, and that steel tires are also in use on cars at the front.

EUROPEAN TRADE NOTES.

SWEDEN.

The Swedish Government is taxing all exceptional profits that are deemed to be due to extraordinary conditions developed by the war. The War Profit Tax Administration in Stockholm, which has the task of estimating these war profits for taxation, recently published a general list from which were obtained the following names of dealers in rubber goods, together with the amounts upon which each will be obliged to pay as war profit taxes: Wahlen & Block, wholesale dealers in rubber mechanical goods, 23,700 crowns [$6,352]; Aktiebolaget Axel Christiersson, wholesale dealers in rubber mechanical goods and general factory supplies, 256,400 crowns [$68,715], and Aktiebolaget Andersson & Pohl, wholesale dealers in scrap rubber, 18,000 crowns [$4,842].

The Aktiebolag J. R. Broman & Co., wholesale dealers in mechanical rubber goods, packings, beltings, etc., 17 Lilla Nygatan, Stockholm, has declared a dividend amounting to 10 per cent.

DENMARK.

Statistics recently published show that the number of automobiles in Denmark on September 1, 1915, was 4,331, as against 3,430 machines at the corresponding date in 1914, and 682 in 1909, when the first statistical information regarding automobiles was published by the Kingdom. Of the total number of machines on September 1, 1915, 3,773 were for passenger use; this number included 1,291 used for cabs or omnibus service. Motor trucks numbered 558. At the same date there were also 6,347 motorcycles in use.

EXTENSION OF EUROPEAN EMBARGO ON EXPORTS OF RUBBER GOODS.

SWEDEN.

The Swedish Government has extended its export embargo to include soles for shoes made of rubber and fabric, and belting made in whole or in part of rubber, gutta percha or balata.

NORWAY.

A recent circular of the Norwegian Foreign Office places an embargo on all exports of rubber goods; also all goods made whole or in part of balata and guttapercha, with the exception of belting.

ITALY.

The Italian Government has prohibited all commercial intercourse with the German Empire both for Italy and its colonies. Further, an export embargo has been placed on all rubber, balata and gutta percha goods, all waste materials and scrap from which rubber may be reclaimed. Benzine is also on this list.

NORTHERN FREIGHT ROUTE TO OPEN.

American exporters will shortly have an opportunity to land goods in Russia without delay from pressure of government shipments. The American-Russian Chamber of Commerce, 60 Broadway, New York City, has received a cablegram from the Russian-American Chamber of Commerce of Moscow announcing that the Pacific port of Nikolaievsk, at the mouth of the Amur River, Siberia, will be opened for navigation June 14. American exporters wishing to avoid the congestion and delays in sending freight by way of Vladivostok should direct shipments to Nikolaievsk. Goods received there will be transported up the Amur River to Stretyinsk, where connection is made with the railroad system.

RUBBER IMPORTS INTO AUSTRALIA.

The British Trade Commissioner for Australia has prepared interesting tables illustrating the share of the United Kingdom, the United States and British Dominions and possessions in the importation of "competitive merchandise" into the Commonwealth of Australia during the year ended June 30, 1916.

Under the heading "India Rubber, and manufactures of," out of total imports from all countries amounting to £481,811 [$2,344,733] Great Britain's share was £214,929 [$1,045,925], the United States ranked second with £118,669 [$577,503], while the share of the British Dominions and possessions was £36,703 [$178,615].

THE RUBBER TRADE IN GERMANY

By Our Regular Correspondent.

PERHAPS the most interesting development here since my last communication is the revival of interest in preparations for the commercial and industrial struggle that is sure to follow this terrible war. The Berlin Chamber of Commerce recently held a general meeting, at which this important subject was discussed at length. The representative business men who attended were unanimous in their belief that measures of preparation should be taken immediately and that adequate quantities of raw material should be purchased—without haste, but as soon as practical—to be held in neutral countries for shipment to Germany as soon as the war ends. All were of opinion that if peace comes before German interests have been able to secure such supplies of raw materials as this country will need, the prices that will be demanded for these materials will be prohibitive, even though our enemies may not attempt to place obstacles in the way of our industries, a course they may decide to adopt.

RUBBER TRADE.

Incertitude is the characteristic of our rubber trade at the present time. No one knows how high prices will be tomorrow nor is anyone sure of being able to get goods at all. Prices are constantly advancing and further articles are being added daily to the list of those no longer obtainable. Dealers have to take practically what they can get, and are often obliged to sell with little or no profit. When prices are communicated to the dealer he finds them excessive, and sets about to see if others are not offering better prices and conditions than those of his regular supplier. By the time he discovers that the prices quoted were right and sends in his order, prices have again advanced and he has no remedy because all quotations are made subject to change without notice.

Both dealer and manufacturer have much to contend with in the way of complaints about the quality of merchandise. Consumers appear to be unable to grasp the fact that war qualities cannot bear the same guarantees as standard peace-time goods, and their distrust and discontent are often increased by the acts of competitors who are able to include standard quality goods in their deliveries. These peace-time manufactures give much better service than the war qualities and, of course, this starts real trouble. The dealer cannot get any redress from the manufacturer, so he is left to adjust matters with consumers, who rarely are disposed to understand and accept his explanations.

Manufacturers also have their troubles. They do their very best to satisfy all needs and then have no small difficulty in inducing dealers to recommend the fruit of their efforts.

RUBBER NIPPLES.

It is practically impossible to comply with health laws and supply rubber nipples under the present conditions. Substitute qualities contain prohibited substances and cannot be used. Recently the Government released a certain amount of crude rubber to be used exclusively for making nipples, but the quantity was inadequate to supply the demand and prices are becoming prohibitory on an article that is essential and is used by the poor in greater quantities than by those who could better afford to pay.

NATIVE RUBBER-YIELDING PLANTS.

Certain people bidding for notoriety have created considerable excitement by stating to the press that a plant indigenous to Central Europe yields a higher percentage of pure rubber than any other plant, and that its cultivation would render Germany independent for her supplies of crude rubber. All this is but a revival of the attempt to exploit the "*Lactuca viminea*" a few years ago. It is interesting from a botanical point of view but of no commercial value. Our chemical factories are producing better rubber than any weeds of the Danube or Elbe valley can supply, and there are good reasons for the hope that they will soon be able to produce it in quantities that can never be expected from our native "rubber vegetables."

EXPORTS TO NEUTRAL COUNTRIES.

Our manufacturers have been facing many difficulties in exporting to such neutral countries as are still accessible to us. The chief cause of complaint is the delay experienced in obtaining export permits. The matter has been taken up with the Government by the "Permanent Committee of German Export Associations," and it is hoped that some relief will soon be secured. These difficulties do not directly affect our rubber industry, which is not generally in a position to export, but they do so indirectly because rubber manufacturing is concerned, to a greater or less extent, in the prosperity of almost all branches of industry.

LEIPSIC FAIR.

The Leipsic Easter Sample Fair was held as usual and the rubber industry was well represented. This was the fourth sample fair held at Leipsic since the outbreak of the war, and was pronounced the most successful.

STATE MONOPOLY OF MECHANICAL POWER.

It is now clear to everyone that the tremendous cost of this war can never be paid for by ordinary or even extraordinary taxation, and many believe that the creation of government monopolies will best solve the problem. It has been suggested that the government be given the monopoly of mechanical power. This would certainly lead to the high development of water power and electricity and would thus result in great benefit to our own as well as all other industries.

CONFISCATION OF TEXTILES.

The law requiring the confiscation of certain supplies of textiles includes duck, or canvas, and drills, also burlaps, all of which are extensively used in our rubber industry. These measures were not taken because the country's supplies are coming to an end. Quantities on hand are sufficient to last for a long time yet. The confiscation is but another instance of the government guarding against any emergencies that may occur, especially as the duration of the war is uncertain.

TRADE NOTES.

Fire broke out recently in the works of Dr. Traun & Söhne (formerly Harburg Rubber Comb Co.) in Hamburg. Prompt action on the part of the employes and the city fire brigade limited the damages to one department in which, however, the loss amounted to over 100,000 marks [$23,800]. The stock of rubber, fortunately, was not damaged.

Otto Werner, of Canstatt-Stuttgart, one of the owners of the great Werner & Pfleiderer organization, on the occasion of the birth of his first son and heir, donated 50,000 marks [$11,900] to needy employes in Stuttgart and 20,000 crowns [$4,060] to such employes in Vienna.

The Excelsior Rubber Works, Hanover, report that 1,000 of their employes and workmen are at the front. Fifty-five have received the Iron Cross for conspicuous bravery and 66 have died on the field of honor.

RUBBER COMPANY DIVIDENDS.

The Asbest und Gummiwerke, Alfred Calmon, A.G., Hamburg, has declared 6 per cent dividend.

A 30 per cent dividend was declared by the Continental Caoutchouc und Gutta Percha Compagnie, Hanover.

The Hanoverscne Actien Gummiwaren Fabrik, Hanover-Linden, declared a dividend amounting to 10 per cent.

The Middledeutsche Gummiwarenfabrik Louis Peter, A.G., Frankfort-on-the-Main, and the Norddeutsche Gummi und Gutta-Perchawarenfabrik (formerly Fanrobert & Reinmann, A.G.), Berlin, each declared a 4 per cent dividend.

A dividend amounting to 6 per cent and one amounting to 11 per cent were declared by the Gummiwerke Elbe, A.G., Klein-Wittenberg, and by the Mannheimer Gummi, Gutta Percha und Asbest Fabrik, A.G., Mannheim, respectively.

The Norddeutsche Jutespinnerei und Weberei, Hamburg, spinners and weavers of jute for the rubber and other industries, have declared 8 per cent dividend.

RUBBER COMPANIES SUBSCRIBE TO FOURTH WAR LOAN.

The Continental Caoutchouc und Gutta-Percha Compagnie, Hanover, together with its employes, have subscribed over 5,000,000 marks [$1,190,000] to the fourth war loan, making the total contributions of this organization to war loans more than 15,000,000 marks [$3,570,000].

Felten & Guilleaume Carlswerk, A.G., Cologne-Mülheim, have subscribed 3,000,000 marks [$714,000] to the fourth war loan. The Guilleaume family, privately, has subscribed 5,000,000 marks [$1,190,000] to this same loan.

The Excelsior Rubber Works, Hanover-Linden, has subscribed 1,000,000 marks [$238,000] to the new war loan.

Gebrüder Feisenberger, wholesale dealers in rubber footwear, Frankfort-on-the-Main, and the Liga Gummiwerke, Frankfort-on-the-Main-Hausen, subscribed 300,000 [$71,400] and 100,000 marks [$23,800], respectively.

AUSTRIA-HUNGARY.

Austrian and Hungarian rubber manufacturers have added 150 per cent to their prices for mechanical rubber goods and placed another 50 per cent advance on their last prices of asbestos goods.

The Hungarian Government has suspended its order requiring the registration of all supplies of crude rubber and automobile tires.

SIAM'S IMPORTS OF AMERICAN AUTOMOBILES.

Siam imported 76 American automobiles in the fiscal year 1913-1914, and only 25 during the fiscal year 1914-1915. These imports formed 40 per cent of the total number of automobiles imported in 1913-1914, and 33 per cent in 1914-1915. In value, imports of British and German automobiles exceeded those of American cars. The total value of the 101 American machines imported during the two fiscal years referred to amounted to $73,945, the average value per car being $728. During 1913-1914 and 1914-1915 Siam imported, from all sources, of automobile parts to the value of $53,526.

PERUVIAN IMPORT DUTY ON TRANSMISSION BELTS.

The Peruvian Government has placed an import duty of 10 per cent ad valorem on transmission belts of cotton or hemp, of leather or of rubber. Hitherto such belts have been exempt from import duty.

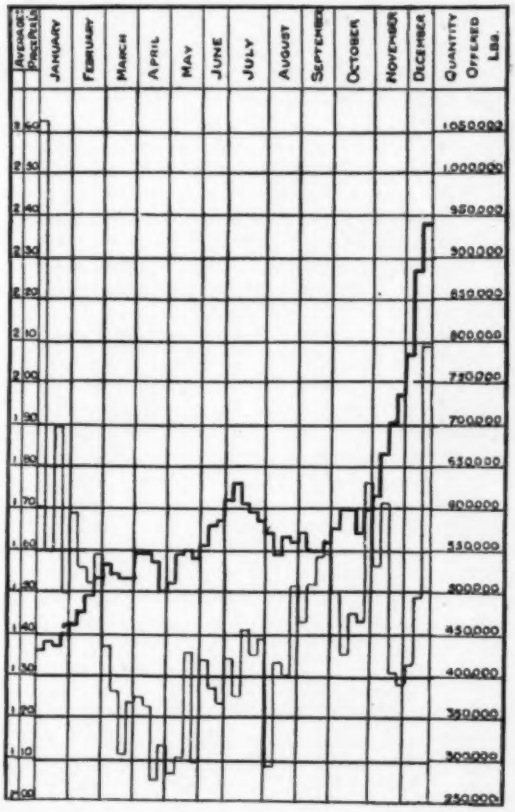
RUBBER ON THE EAST COAST OF SUMATRA.

The growth of the rubber plantation industry on the East Coast of Sumatra in the past 10 years has been remarkably rapid. From 3,305 acres in 1905, rubber plantations grew to cover 73,826 acres in 1910, and 245,000 acres in 1914, when the last census was taken.

In the Tamiang district of Sumatra rubber plantations only date back to the boom in 1909, when a start was made with 2,250 acres. Today the plantations cover more than 14,000 acres.

The crude rubber exported from the East Coast and from the Tamiang district of Sumatra includes plantation sorts (*Hevea* and *Ficus*), and also wild rubber of the *Ficus elastica* genus.

DIAGRAM SHOWING THE WEEKLY RISE AND FALL IN THE PRICES AND QUANTITIES OF RUBBER (ALL GRADES) OFFERED AT LOCAL AUCTIONS, HELD IN CEYLON DURING 1915.



Compiled by the Ceylon Chamber of Commerce.

THE LIGHT LINE DENOTES THE QUANTITY OFFERED FOR SALE. THE HEAVY LINE DENOTES THE AVERAGE PRICE PER POUND REALIZED.

SINGAPORE RUBBER AUCTIONS.

At the annual general meeting of the Singapore Chamber of Commerce, which was held in February, it was stated that 51 rubber auctions had been held during the year 1915, and, of a total of 27,010 tons of rubber exported from Singapore in that year, 7,322 tons were sold at these weekly auctions. The amount of rubber disposed of at private sale was still considerable, but the proportion of the total business embraced by the auction sales showed steady increase. Prices obtained at the auctions were reported most satisfactory, and in the great majority of cases compared favorably with London values ruling at the same dates. The highest prices realized were: 204 Straits Settlements dollars per picul (about 87 cents per pound) for ribbed smoked sheet, and 209 Straits Settlements dollars per picul (about 90 cents per pound) for fine crêpe, as compared with 141 and 146 Straits Settlements dollars per picul (about 58 and 61 cents per pound) respectively, in 1914.

The Chairman confidently anticipates that in the future Singapore would steadily increase its influence in the crude rubber market.

Rubber Planting Notes.

CRUDE RUBBER EXPORTS FROM FRENCH INDO-CHINA.

THE latest available official statistics regarding crude rubber exports from French Indo-China are for the calendar year 1914, and show that the total of these exports for the period covered amounted to 180,692 kilograms [397,522 pounds], and were distributed as follows:

France:—
Plantation rubber ..... Pounds 297,161
Wild Forest rubber ..... " 79
Singapore:—
Plantation rubber ..... Pounds 100,283

Compared with 1913 these figures show a decrease of 66,000 pounds in the exports of plantation rubber to France and a decrease of 8,800 pounds for the same exports to Singapore. The year 1913 was, however, exceptional, for the plantation rubber exports to Singapore amounted to 99,000 pounds against 13,200 pounds in 1912. The decrease in the plantation rubber exports to Singapore during 1914 was due to the fact that the great Michelin company of France bought up the whole output of one of the largest plantations of Indo-China.

However, the fact remains that the war has injuriously affected the plantation rubber industry in French Indo-China. The measures of financial conservation which the Allies took from the very beginning of the war prevented the sale of plantation shares on European markets and, as reported in THE INDIA RUBBER WORLD for February, 1916, many plantations would have been obliged to abandon operations had the local government not been able to negotiate loans through the Banque de l'Indo-Chine for the benefit of those *Hevea* planters most seriously affected. These loans accomplished great good, because they were timely and were allowed only after careful investigation of both the planting and the financial condition of the plantations.

DIFFERENCE IN QUALITY OF HEVEA LATEX.

A rubber expert writing in the "Monthly Bulletin of Agricultural Intelligence and Plant Diseases" is of opinion that the properties of *Hevea* latex vary according to the tree from which it is obtained, and he bases his opinion on determinations of viscosity of rubber in solution in benzene. He made up an index of viscosity, and discovered large differences among the individual trees yielding the rubber. This expert also believes that there is a correlation between the color of the latex and the quality of the rubber obtained from it. It would appear that these observations are of use in the selection of seed-bearing trees.

EXPERIMENTS FOR PREVENTING THE BARK ROT DISEASE OF RUBBER TREES.

The Progress Report of the Peradeniya Experiment Station, Peradeniya, Ceylon, contains interesting reference to experiments conducted at that station for preventing the development of the bark rot disease of rubber trees.

The newly tapped surfaces of the trees are covered with a thin coating of a mixture made by boiling 1 ounce of sulphur in half a kerosene tin [2½ gallons] of water and adding equal parts of animal compost and clay till a thick paste is obtained. A pinch of salt is added to keep the paste moist and prevent cracking and peeling off from the tree. The object of this treatment is to protect the exposed delicate, cambium layer from sun and drying winds, as a precaution against the bark rot, and to encourage good bark renewal. The experiments proved it to be advisable to apply this treatment monthly during the dry weather to within a quarter of an inch of the tapping area.

RUBBER IN BURMA.

For years past the government of British Burma has been undecided as to the revenue which the rubber industry there ought to yield to the Provincial Exchequer and the longstanding discussion as to the extent of the government's share has materially retarded the industry.

Most of the plantations are on leased lands, paying a rent to the government; and all along there appears to have existed a feeling that, in addition to the rent, the rubber planters, whether private individuals or limited companies, should pay something additional either in the form of a royalty or as an export duty, as is done in Ceylon and elsewhere.

Recently a deputation representing the Upper and Lower Burma Planters' Association called upon the Lieutenant-Governor and views of the situation were interchanged.

Among the suggestions made, one, that is most likely to be acceptable to both the local government and the planters, proposes that the latter pay an equitable rent for the land under rubber and a further contribution based on the selling price of rubber in London. This payment would rise and fall as the selling price fluctuates.

The matter is now in the hands of the government, which has decided to refer the proposals for fuller discussion and to evolve some definite proposition, to a sub-committee in which both sides are represented.

The climate of Burma is considered a good one for rubber growing, and the proposed arrangement, if definitely adopted, should encourage people in going into the rubber planting business in the colony.

INDENTURED LABOR FOR RUBBER ESTATES.

India and Java have, for many years, been the source of labor supply for all parts of the tropical world, India furnishing labor chiefly to Ceylon and Malaya, while Java was the supplier of hands for Sumatra and other countries. This labor received "coast advances" and similar money and was indentured for three or more years.

Recently the government of the Netherlands and East Indies put a stop to the three-year indenture of Javanese coolies for Sumatra, and now it is said that the Government of British India will follow suit by deciding to abolish the system of Indian indentured labor.

Such a policy would affect the labor of the whole of the tropical world, including Jamaica, Trinidad, British and Dutch Guiana, Fiji, etc., but it would be particularly felt on Ceylon and Malayan rubber plantations where labor is of vital importance and, as before said, comes chiefly from India.

ELEPHANTS UPROOTING RUBBER TREES.

It is reported from the Middle East that several large rubber estates in the Kalutara district of Ceylon are using elephants for thinning out work. This scheme for uprooting rubber trees was first resorted to in Kalutara, it is said, by a contractor, who, having entered into a felling agreement, made a profitable business of it by this method.

PROPOSED JAPANESE CUSTOMS TARIFF REVISION.

A Government Bill recently introduced in the Japanese Diet (Parliament) proposes to modify the customs duties on various articles imported into Japan. Among these articles are seeds of rubber and gutta percha trees which are proposed for the free list. These seeds are not specified in the tariff rates now in force.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED MARCH 21, 1916.

NO. 1,175,940. Suction roll, the metal shell portion of which is covered with rubber. H. R. Farnsworth and T. H. Savery, Jr.—both of Sandusky, Ohio.

1,176,065. Tire armor. W. K. Knight, Dexter, Mo.

1,176,073. Pneumatic tire. L. McKinnon, Salt Lake City, Utah.

1,176,141. Erasing pencil. C. L. Heisler, Schenectady, N. Y.

1,176,145. Tire-carrying rim. E. Hopkinson, East Orange, N. J., assignor to United States Tire Co., New York City.

1,176,146. Instrument for administering anesthetics comprising rubber tubing. F. B. Jones, Cleveland, Ohio.

1,176,158. Pneumatic tire. J. V. Markle, assignor of one-half to C. F. Nast, both of Seattle, Wash.

1,176,159. Cushion tire. T. Midgley, Worthington, Ohio, assignor to Morgan & Wright, Detroit, Mich.

1,176,161. Tire tread. A. P. Nirdlinger, Chicago, Ill.

1,176,165. Resilient tire. M. Rasmussen, Racine, Wis.

1,176,209. Joint for elastic dolls and other figures. G. R. Dice, Ashland, Ohio.

1,176,220. Automatic chair blower, comprising air hose. A. Kaczmaszky, Piper, Ala.

1,176,230. Tool for contracting detachable wheel rims. V. McLain, East Moline, Ill.

1,176,286. Heelless rubber overshoe. C. S. Goodyear, Naugatuck, assignor to L. Candee & Co., New Haven—both in Connecticut.

1,176,288. Rubber insulating splice cover. J. B. Hamilton, Hoboken, N. J.

1,176,295. Tread for tires. F. S. Ingoldsby, Pine Lake, Mich.

1,176,305. Rubber soled boot or shoe. C. Lee, assignor to The Goodyear's Metallic Rubber Shoe Co.—both of Naugatuck, Conn.

1,176,338. Combined tire valve and pressure gage. O. F. R. Bromberg, San Diego, Calif.

1,176,424. Puncture-proof tire lining. A. F. Brady, assignor of one-half to E. C. Mailliard—both of San Francisco, Calif.

1,176,511. Cushioning body for tire casings. F. Zuber, Reading, Pa.

1,176,518. Self-propelling hose nozzle. J. T. Burns, New York City.

1,176,529. Self-filling fountain pen. W. I. Ferris, Westfield, N. J., assignor to L. E. Waterman Co., New York City.

1,176,552. Puncture-proof tube for pneumatic tires. A. E. Henderson, Toronto, Ontario, Canada, assignor to Superior Tubes & Accessories, Limited, a corporation of Canada.

1,176,553. Tube for pneumatic tires. A. E. Henderson, Toronto, Ontario, Canada, assignor to Superior Tubes & Accessories, Limited, a corporation of Canada.

1,176,560. Non-skidding band for tires. A. T. Hughes, Kew Green, England.

1,176,647. Shoe sole having elastic tread members. A. Bucolo, Washington, D. C.

1,176,671. Vehicle wheel for demountable tires. E. W. Fothergill, assignor to Hartford Rubber Works—both of Hartford, Conn.

1,176,674. Rubber nursing nipple. A. G. Gardiner, Providence, R. I.

ISSUED MARCH 28, 1916.

1,176,760. Resilient tire. F. G. Koehler, St. Louis, Mo.

1,176,783. Brush attachment for erasers. H. J. Sommerkamp, Glen Ridge, assignor to Consolidated Safety Pin Co., Bloomfield—both in New Jersey.

1,176,839. Support for timepieces. S. G. Lewis, Greensburg, Pa.

1,176,840. Watch holding and attaching device. S. G. Lewis, Greensburg, Pa.

1,176,886. Inhaler. G. Ermold, New York City.

1,176,907. Pressure indicator. H. P. Kraft, New York City, and M. C. Schweinert, West Hoboken, N. J.

1,176,909. Eraser and pencil holder. W. E. Lane, Kansas City, Mo.

1,176,910. Elastic bandeau. A. G. Lee, Colorado Springs, Colo.

1,177,048. Pneumatic tire. M. C. Overman, New York City.

1,177,060. Cover for dress shields. F. Scovel, New York City.

1,177,063. Valve for pneumatic tires. B. E. Taylor, Oak Park, Ill.

1,177,099. Elastic horseshoe calk. F. J. Glanville, Morristown, N. J.

1,177,128. Hydrometer comprising a rubber bulb. M. E. Moeller, Brooklyn, N. Y.

1,177,136. Rubber boot or shoe. R. B. Price, New York City, assignor to Rubber Regenerating Co., Mishawaka, Ind.

1,177,203. Pulmotor. J. H. Pierpont, Pensacola, Fla.

1,177,206. Hose reel. F. Nemec, Chicago, Ill.

1,177,263. Inflatable pneumatic rubber for vehicle sleds. J. E. Ollivier, St. Gervais, France.

1,177,299. Tire valve. T. P. Borden, assignor to R. B. Low—both of New York City.

1,177,316. Hose rack. H. Gibbs, assignor to W. D. Allen Manufacturing Co.—both of Chicago, Ill.

1,177,350. Rubber vehicle tire. J. Monson, New York City.

1,177,383. Mouth connection for portable breathing apparatus. F. L. Claren, assignor to Firm of Drägerwerk, Heinr. & Bernh. Dräger—both of Lübeck, Germany.

1,177,388. Massage apparatus. H. L. Crane, New York City.

1,177,412. Rubber glove. J. Hopkins, North Attleboro, Mass.

1,177,438. Smoke helmet comprising air tube. B. Newman, New York City.

1,177,456. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of two-fifths to The B. F. Goodrich Co., New York City; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio, and one-fifth to the United States Tire Co., New York City.

1,177,457. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of two-fifths to The B. F. Goodrich Co., New York City; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio, and one-fifth to the United States Tire Co., New York City.

1,177,458. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of two-fifths to The B. F. Goodrich Co., New York City; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio, and one-fifth to the United States Tire Co., New York City.

1,177,459. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of two-fifths to The B. F. Goodrich Co., New York City; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio, and one-fifth to the United States Tire Co., New York City.

1,177,460. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of two-fifths to The B. F. Goodrich Co., New York City; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio, and one-fifth to the United States Tire Co., New York City.

1,177,461. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of two-fifths to The B. F. Goodrich Co., New York City; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio, and one-fifth to the United States Tire Co., New York City.

1,177,462. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of two-fifths to The B. F. Goodrich Co., New York City; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio, and one-fifth to the United States Tire Co., New York City.

1,177,474. Friction and metal plug for rubber heels. F. Berenstein, Chelsea, assignor to Panther Rubber Manufacturing Co., Stoughton—both in Massachusetts.

1,177,500. Hose patch. M. O. Dolson, Los Angeles, Calif.

1,177,549. Pneumatic tire. E. M. Stewart, Montpelier, Idaho.

1,177,582. Two wheel rubber-tired apparatus to aid blind to walking. F. Murphy, New York City.

ISSUED APRIL 4, 1916.

1,177,593. Vehicle tire. S. Ch. Bellou, Brockton, Mass.

1,177,601. Rim clamp. R. S. Bryant, assignor to The Standard Welding Co.—both of Cleveland, Ohio.

1,177,627. Inner tube for vehicle tires. J. M. Hunt, Atlanta, Ga.

1,177,630. Automatic tire alarm. A. T. Johnson, East Las Vegas, N. Mex.

1,177,636. Reel for elastic tape, etc. C. P. Kuehn, assignor to A. Stein & Co.—both of Chicago, Ill.

1,177,650. Demountable rim. G. H. Parks, Grand Rapids, Mich.

1,177,669. Tire protector. W. E. Wilson and S. S. Wilson—both of Des Moines, Iowa.

1,177,684. Suspender buckle and webbing combination. H. E. Crandall, New Britain, Conn.

1,177,759. Water bag and syringe. W. J. Butler, Springfield, Ill.

1,177,795. Automobile horn. C. Nagele, assignor to Lee Tire & Rubber Co.—both of Conshohocken, Pa.

1,177,808. Pedal pad. G. H. Rives, New York City.

1,177,902. Method of applying rubber washers to valves or the like. M. C. Schweinert, West Hoboken, and H. P. Kraft, Ridgewood—both in New Jersey.

1,177,930. Tire protector for use within the shoe of a pneumatic tire. H. J. Cohrs, West New York, N. J.

1,177,979. Suction holding means for dental plates. F. W. Wilson, Willits, Calif.

1,178,008. Spring wheel with solid rubber tire. M. E. Hanson and J. B. Keyser—both of Stanley, Va.

1,178,074. Tire tread. W. J. Howard, Seattle, Wash.

1,178,145. Pipe testing plug having an open annular rubber gasket. J. Florence and C. Frauer—both of Indianapolis, Ind.

1,178,202. Demountable cushion tire. W. H. Allen, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.

1,178,327. Resilient vehicle wheel comprising two outer rims having interposed rubber blocks. G. H. McKinnis and L. E. Neale—both of Wardner, Idaho.

1,178,361. Ornamented rubber ball. C. Van Sciver, assignor to Lambertville Rubber Co.—both of Lambertville, N. J.

1,178,414. Fountain pen. H. Sawamura, New York City.

1,178,421. Combined air mattress and life preserver. C. T. Smith, Mabton, Wash.

1,178,481. Tire-removing clamp. A. M. Roland, assignor to A. Newhouse—both of San Francisco, Calif.

ISSUED APRIL 11, 1916.

1,178,484. Hose. G. A. Ansell, assignor to Dunlop Tire & Rubber Goods Co.—both of Toronto, Canada.

1,178,517. Jar closure comprising an inelastic rubber ring. H. Hartmann, assignor to Firm Globus, Gummi & Asbestwerke G. M. B. H.—both of Ahrensböck, Germany.

1,178,541. Vehicle wheel rim. E. C. Shaw, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.

1,178,559. Flexible gas tubing. J. J. Vautier, New York City.

1,178,741. Piston packing strip formed of alternate parallel layers of fabric and rubber. C. I. E. Mastin, Midland Park, N. J.

1,178,754. Sectional wheel rim. R. R. Royal, San Francisco, Calif.

1,178,809. Tire valve. H. P. Kraft, New York City, and M. C. Schweinert, West Hoboken, N. J., assignors to A. Schrader's Son, Inc., New York City.

1,178,821. Elastic apparel belt. M. Scheuer, assignor to American Belt Corporation—both of New York City.

1,178,833. Shaving brush embodying a disc of rubber sponge and an embracing elastic band. F. W. Bacorn, Sewickley, Pa.

1,178,839. Hose coupling. R. Carlson, Greenwich, Conn.

1,178,869. Overlay for half-tone printing having a cushioning surface of rubber. J. B. Neale, assignor of one-half to F. W. Gage—both of Battle Creek, Mich.

1,178,870. Half-tone overlay formed of rubber. J. B. Neale, assignor of one-half to F. W. Gage—both of Battle Creek, Mich.

1,178,874. Life preserver including a bag of flexible waterproof material. N. K. Ramos, Lansing, Mich.

1,178,944. Rubber typewriter eraser. N. Ransom, Jersey City, N. J.

1,178,968. Resilient tire. J. M. Taylor, Uno, Va.

1,179,018. Life-saving appliance. H. McFarlane and N. E. Rogers, assignors to Boddy Lifesaving Appliances, Limited—all of London, Eng.

1,179,086. Fountain pen. J. O. Foster, Seattle, Wash.

1,179,123. Vehicle wheel. S. R. McKay, East Cleveland, Ohio.

1,179,159. Rubber banding in knickerbockers for women, etc. O. E. Buley, London, Eng.

1,179,272. Life-saving appliance. G. M. Boddy, assignor to Boddy Lifesaving Appliances, Limited—both of London, Eng.

Re-issue.

14,110. Life preserver. O. A. Youngren, assignor to National Life Preserver Co.—both of Sheridan, Wyo.

THE DOMINION OF CANADA.

ISSUED JANUARY 31, 1916.

167,006. Sleeping bag having incorporated therein a waterproof sheet. W. H. Simpson, Montreal, Quebec, Canada.

167,033. Garter. The I. B. Kleinert Rubber Co., assignee of R. K. Guinzberg—both of New York City.

167,066. Hose nozzle. A. E. Eilertsen, Stamford, Conn.

167,295. Rim for vehicle tires. J. G. Rolf, Covington, Kentucky.

167,302. Waterproof cover for automobiles and collapsible water part. F. B. Sullivan, Carson City, Nevada.

THE UNITED KINGDOM.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent upon the filing of the application.

**Denotes Patents for American Inventions.*

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MARCH 15, 1916.]

22,498 (1914). Nail polisher comprising an inflatable bladder. J. H. Devlin, 20 Rue Cambon, Paris.

22,569 (1914). India rubber pads in a machine for forming hat covers. F. A. Dunkerley, 198 Marlborough street, Ryecroft, Ashton-under-Lyne.

22,638 (1914). Sheet rubber linings for neck-ties. W. Hey, 6 Grimstone Terrace, Hull Road, York.

22,667 (1914). Corset mainly of elastic webbing. A. Soum, 138 Brompton Road, London.

22,734 (1914). Flooring for ships' decks, in which rubber filling is used between sections. Wailes, Dove & Co., 5 St. Nicholas Buildings, St. Nicholas street, Newcastle-on-Tyne, and C. MacDonald, 71 Julian avenue, South Shields.

22,774 (1914). Rubber covered canvas receiving screen for kinematograph projection. British Patent Surbrite Co., and E. G. Meadway—both of 31 Lombard street, London.

22,781 (1914). Rubber rims for lamp shades. F. A. Andrews and T. G. Allen—both of 106 Victoria street, Westminster.

100,026 (1916). Rubber tube for pharmaceutical preparations. M. de Jong, 16 J. D. M. Plein, Amsterdam.

100,038 (1916). Rubber in the manufacture of artificial leather. N. G. Scheuer, 6 Gyldenlovesgade, Copenhagen.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MARCH 22, 1916.]

22,829 (1914). Cushion tire. T. Thibal, 4 Rue du Commandant Riviere, Paris.

22,850 (1914). Waterproof sleeping bag. H. M. Knight, 9 Lilypot Lane, London.

22,855 (1914). Toy boats, etc., propelled by twisted rubber bands. G. Thomas, 46 Gunter Grove, Chelsea, London.

22,890 (1914). Toy gun with rubber disc projectiles. G. W. Kingsland, Tunnel Hill, Worcester.

22,938 (1914). Billiard table cushion. W. J. Mellersh-Jackson, 38 Southampton Buildings, London.

*22,975 (1914). Gramophone sound box formed of hard and soft rubber parts. A. D. Jones, 46 Sibley Building, 1214 Filbert street, Philadelphia, Pa.

23,065 (1914). Rubber soles with reinforcing plate of sheet metal. F. W. Poulden, 115a Trafalgar Road, Greenwich, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MARCH 29, 1916.]

23,077 (1914). Rubber ring in apparatus for delivering measured quantities of liquid. R. Powley & Sons, and M. Powley, 3 Handel street, Sunderland.

23,132 (1914). Flexible breathing bag. R. H. Davis, 187 Westminster Bridge Road, London.

23,170 (1914). Surgical probe having rubber encased conductor tubes. D. Findlay, 74 Woodside, Wimbledon, London.

23,177 (1914). Spring wheel with continuous outer rigid ring and pneumatic cushion. W. Morgan, Hafod Arael, Abertillery, Monmouthshire.

*23,241 (1914). Tire protector for insertion betwen the air tube and cover. A. Dow, 1733 Broadway, New York City.

23,283 (1914). Telephone receiver with vulcanite cap. L. Brown and C. Macintosh & Co., Cambridge street, Manchester.

23,309 (1914). Non-skid device for wheel tire. W. Cross, 10 New Court, Lincoln's Inn, London. (J. R. Peck, Boston, Massachusetts.)

*23,310 (1914). Elastic self-adjusting waistband for women's garments. A. Malsin, 25 West 38th street, New York City.

23,313 (1914). Sheet armor for body wear, or for protection of aeroplanes, ships and cars of dirigible balloons enclosed in cotton and india rubber cloth. N. Lacrotte, 136 Avenue Parmentier, Paris.

23,320 (1914). Rubberized leather protectors for pneumatic tires. A. M. Kobiolke, 18 Gordon avenue, Kew, near Melbourne, Australia.

23,326 (1914). An attachment for watering cans, hose pipes, etc., comprising a rubber ring. T. H. Webster, Stock, Ingatestone, Essex.

23,356 (1914). Wheel tire. A. Rosa, 46 Corso Casale, Turin, Italy.

23,358 (1914). Wheel tire. A. Rosa, 46 Corso Casale, Turin, Italy.

23,439 (1914). Marine life-saving apparatus, inflatable and buoyant. J. Davis, The Cottage, Turley, Bradford-on-Avon, Wiltshire.

23,462 (1914). Toy operated by elastic cords. T. Crawford, Wilton House, Stapleton Place, Dundalk, Ireland.

23,439 (1914). Metal and rubber disc bottle closures. H. Birbeck, 329 High Holborn, London. (L. M. Rosenthal, 1105 Park avenue, Mount Vernon, New York.)

23,510 (1914). Tread band comprising solid square headed studs secured by riveting to a rubber and canvas band. H. Agha, Eagle Lodge, Hale, Cheshire.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, APRIL 5, 1916.]

23,545 (1914). Truss pad comprising an india rubber envelope. H. C. Stephens, Cholderton, Wiltshire.

23,550 (1914). Mine signaling device employing a rubber block. J. J. C. Allison, Lunton, Butterknowle, and J. Waller, Woodlands Colliery—both in Durham.

*23,562 (1914). Rubber rings in paper cutting and winding machine. C. H. Thordarson, 501 South Jefferson street, Chicago, Ill.

23,585 (1914). Rubber buffers in machine for polishing or scouring needles, etc. C. E. Baylis, 34 Millsboro' Road, Redditch, Worcestershire.

23,610 (1914). Reinforced rubber sole pads for boots and shoes. W. W. Phillips, 142 Old street, London.

23,737 (1914). Non-skid device for twin tires. F. H. Sheppee, 7 Thomas street, and S. G. Jowitt, 104 Lawrence street—both in York.

23,779 (1914). Combined leg rests and walking sticks with rubber and caps. G. E. Marshall, 28 Chilworth street, Paddington, London.

23,870 (1914). Inhaler preferably made of india rubber or gutta percha. A. P. Stokes, 36 Wei Hai Wei Road, Shanghai, China.

23,895 (1914). Protector for breech action and magazine of a rifle of waterproof fabric. W. C. Hammond, St. Augustine, East Moslesey, Surrey.

NEW ZEALAND.

ISSUED FEBRUARY 17, 1916.

36,987. Milking machine teat cup. N. J. Daysh, Carterton, New Zealand.

36,989. Tire tube valve connection. A. E. Henderson, Kent Building, Toronto, Canada.

37,084. Hose nozzle and the like attachment. C. Dobbie, 4 Warwick street, Hobart, Tas.

ISSUED MARCH 2, 1916.

36,790. Brush and brush manufacture. The Rubber Set Brush Co., Limited, 21 Bucklersbury, London, England.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

478,238 (April 1, 1915). Plugs for stopping perforations in pneumatic tires. B. W. Spitler.

478,294 (April 6). Splash guard for automobile wheels and others. E. D. Self.

478,295 (April 6). Tire with a mud guard. E. D. Self.

478,303 (April 7). Improved pneumatic tire pump. J. Heeley.

478,416 (April 16). Pneumatic tire. The American Tire Co.

478,424 (April 17). Improved reinforced armor for pneumatic tires. M. Patrick.

478,454 (April 20). Improved valves for pneumatic tire inner tubes. C. E. Baker.

478,470 (April 22). Elastic wheel. E. Basjanoff.

THE GERMAN EMPIRE.

PATENT ISSUED (With Date of Validity).

641,270. Elastic solid tire for vehicle wheels. National Antriebs, G. m. b. H.

TRADE-MARKS.

THE UNITED STATES.

90,618. Stamstag and Hilder Bros., New York City. A coat of arms with the word *Colonial*. For bathing caps made of rubber, etc.

91,432. The Miller Rubber Co., Akron, Ohio. The words *Glee Bub-Lets*. For rubber balloons.

92,313. Woonsocket Rubber Co., Woonsocket, R. I. The word *Vulcan*. For rubber boots and shoes.

92,574. A. B. Mann, New York City. Illustration of the world with the words *Mann's Universal Elastic Bandage*. For elastic bandages.

92,746. The De Press Chemical Co., Holland, Mich., and Chicago, Ill. The word *San-Tox*. For hot water bottles, fountain syringes and combination syringes.

81,939. The Gordon Rubber Co. (now by change of name The Gordon Tire & Rubber Co.), Canton, Ohio. Representation of a cone on each side of the word *Gordon*. For rubber tires and tubes.

91,518. The B. F. Goodrich Co., New York City. Representation of an automobile tire. For automobile tire casings composed of rubber and fabric.

92,170. J. L. Schnell, New York City. The words *The Master Pen*. For fountain pens.

92,378. The William A. Welty Co., Waterloo, Iowa. The word *Waterco*. For fountain pens.

92,720. American Rubber Co., Boston, Mass. The words *Oil King*. For raincoats.

89,403. Franklin Caro Co., Richmond, Va. Illustration of a mint leaf with the words *Richmint Gum*. For chewing gum.

91,921. Joseph A. Vogel Co., Wilmington, Del. Illustration of a seal with the word *Airtite* and the representation of a pneumatic tire. For a sealing liquid for pneumatic tires.

92,338. The Goodyear Tire & Rubber Co., Akron, Ohio. The word *Imperator*. For hose and rubber surfaced fabric belting.

92,356. Craddock-Terry Co., Lynchburg, Va. The word *Pollyanna*. For shoes made of leather, rubber and canvas.

92,416. L. J. Levy, New York City. The words *Vitra Magnetic*. For rubber massage brushes.

92,528. Kokomo Rubber Co., Kokomo, Ind. Representation of a tire divided into red, white and blue sections. For pneumatic tires composed of rubber.

91,457. Simmons Sales Co., Springfield, Mo. The word *Simmons*. For suspenders, garters, etc.

91,458. Simmons Sales Co., Springfield, Mo. The word *Doshi*. For suspenders, garters, etc.

91,459. Simmons Sales Co., Springfield, Mo. Representation of the initials *S S Co.* and the words *Simco Mills*. For suspenders, garters, etc.

91,834. The Gordon Tire & Rubber Co., Canton, Ohio. The word *Everrite*. For rubber druggists' sundries.

92,354. Brownell Auto Co., Inc., Birmingham, Ala. The word *B-A-C-O*. For automobile inner tubes, rubber hose, etc.

93,340. The Mechanical Rubber Co., New York City. The word *Nobby*. For golf balls.

93,347. A. Stein & Co., Chicago, Ill. Representation of a rabbit with the word *Bunny*. For garters.

NEW ZEALAND.

12,319. Adolph Frankau and Co., Limited, 119 Queen Victoria street, London, E. C., England. The word *Diana*. For pouches manufactured of india rubber or gutta percha.

THE DOMINION OF CANADA.

21,402. Hyslop Brothers, Limited, Toronto, Ontario. The words *Skid-Grip*. For tires.

21,427. The Goodyear Tire & Rubber Co., Akron, Ohio. The word *Neolin*. For soles and heels for boots and shoes made from an artificial composition.

DESIGNS.

THE UNITED STATES.

48,789. Tire. W. A. S. Mauk, Baltimore, Md.
48,854. Automobile tire. W. P. Braender, Passaic, N. J.

THE GOODYEAR TIRE MILEAGE COST CHART.

Motorists that give close attention to tire mileage and who figure on the cost of the tire per mile instead of considering the original cost, will be interested in the accompanying chart compiled by the Goodyear Tire & Rubber Co., Akron, Ohio, reproduced in the next column.

To find the tire cost per mile, the initial cost of the tire and the tire mileage received must be known. Then by stretching a thread or rubber band from a point in the first column representing the initial tire cost, to a point in the third column representing the tire mileage received, the tire cost per mile may be read at the point of intersection in the second column. Moreover, the chart is valuable in showing the economy of oversized tires. Through the use of these tires, the tire cost per mile is invariably reduced, and at the same time easier riding qualities and freedom from tire trouble gained.

STATEMENT OF THE INDIA RUBBER WORLD.

Statement of the ownership, management, etc., required by the Act of Congress of August 24, 1912, of THE INDIA RUBBER WORLD, published monthly at New York, N. Y., for April 1, 1916.

STATE OF NEW YORK } ss.
COUNTY OF NEW YORK }

Before me, a notary public in and for the State and county aforesaid, personally appeared E. M. MacPhee, who, having been duly sworn according to law, deposes and says that she is the Business Manager of THE INDIA RUBBER WORLD, and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, The India Rubber Publishing Co., 25 West Forty-fifth street, New York City.

Editor, Henry C. Pearson, 83 Agawam Road, Waban, Massachusetts.

Managing Editor, None.

Business Managers, William M. Morse, 99 North Broadway, Tarrytown, New York; E. M. MacPhee, 344 West Forty-eighth street, New York City.

2. That the owners are (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock):

Henry C. Pearson, 83 Agawam Road, Waban, Massachusetts.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

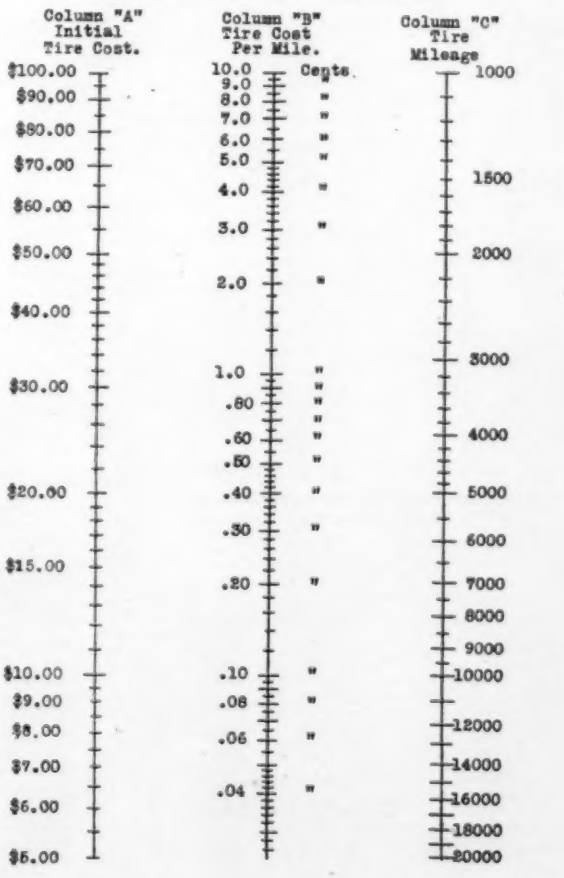
E. M. MACPHEE.

Sworn to and subscribed before me this 31st day of March, 1916.

[SEAL] FREDK. SPRINGER,
Notary Public, Westchester County.

Certificate filed in New York County.
New York County Clerk No. 138. Register's No. 8226.
(My commission expires March 30, 1918.)

GOODYEAR TIRE MILEAGE COST CHART.



Official India Rubber Statistics for the United States.

Fiscal Year Ended June 30, 1915.

INDIA RUBBER.

IMPORTS OF CRUDE INDIA RUBBER (FREE).

FROM—	POUNDS.	VALUE.
Europe:		
Belgium	1,902,370	$950,872
France	685,699	284,862
Germany	739,105	358,931
Netherlands	313,407	161,543
Portugal	4,130,624	1,374,526
Spain	20,463	10,510
United Kingdom—England	75,168,236	39,188,519
Totals, Europe	82,960,904	$42,329,763
North America:		
British Honduras	3,088	$1,100
Canada	4,973,436	2,788,824
Central American States—		
Costa Rica	60,187	29,681
Guatemala	32,569	16,001
Honduras	28,607	11,231
Nicaragua	378,349	188,109
Panama	267,148	102,602
Salvador	20,420	10,342
Mexico	1,827,912	706,350
Totals, North America	7,591,716	$1,064,340
South America:		
Brazil	48,753,670	$20,738,776
Chile	148,343	75,239
Colombia	426,005	182,458
Ecuador	366,139	136,903
Guiana—Dutch	1,800	1,041
Peru	3,154,210	1,334,363
Uruguay	142,103	75,529
Venezuela	469,790	203,257
Totals, South America	53,462,060	$22,747,566
Asia:		
British East Indies—		
British India	87,804	$43,089
Straits Settlements	13,225,775	6,645,079
Other British	10,549,113	5,249,183
Dutch East Indies	4,035,991	2,114,247
Japan	5,059	261
Russia in Asia	38,054	2,448
Totals, Asia	27,941,796	$14,054,307
Oceania:		
Philippine Islands	3,818	$1,738
Africa:		
Belgian Kongo	102,750	$41,265
British South Africa	1,190	337
Portuguese Africa	5,194	1,053
Totals, Africa	109,134	$42,655
Totals, 1914-15	172,068,428	$83,030,269
Totals, 1913-14	131,995,742	71,219,851
Totals, 1912-13	113,384,359	90,170,316
Totals, 1911-12	110,210,173	93,013,255
Totals, 1910-11	72,046,260	76,244,603
Totals, 1909-10	101,044,681	101,078,825
Totals, 1908-09	88,359,895	61,709,723
Totals, 1907-08	62,233,160	36,613,185
Totals, 1906-07	76,963,838	58,919,981
Totals, 1905-06	57,844,345	45,114,450

IMPORTS OF MANUFACTURES OF INDIA RUBBER (DUTIABLE).

[+ indicates increase; — indicates decrease, compared with the preceding year.]

FROM—	VALUE.
Europe:	
Austria-Hungary	$42,224—
Belgium	30,301—
Denmark	22+
France	49,795—
Germany	264,771—
Italy	9,349+
Netherlands	1,161+
Norway	179+
Russia in Europe	23,375—
Sweden	34+
Switzerland	38—
United Kingdom—	
England	272,711—
Scotland	14,705—
Ireland	119—
Totals, Europe	$708,784
North America:	
Canada	$80,429+
Mexico	436+
Newfoundland and Labrador	120
Totals, North America	$80,985
South America:	
Argentina	$7
Asia:	
Japan	$1,023—
Turkey in Asia	395+
Totals, Asia	$1,418
Oceania:	
Australia	$29—
New Zealand	58
Totals, Oceania	$87
Totals, 1914-15	$791,281
Totals, 1913-14	1,517,789
Totals, 1912-13	1,217,236
Totals, 1911-12	874,736
Totals, 1910-11	875,125
Totals, 1909-10	1,154,347
Totals, 1908-09	1,391,770
Totals, 1907-08	1,956,590
Totals, 1906-07	2,262,783
Totals, 1905-06	1,992,413

RE-EXPORTS OF IMPORTED CRUDE INDIA RUBBER.

TO—	POUNDS.	VALUE.
Belgium	5,310	$1,935
Denmark	310,724	178,696
Finland	1,982	1,631
France	304,010	138,977
Germany	36,546	13,261
Italy	604,515	366,123
Netherlands	14,474	6,400
Norway	196,175	106,505
Russia in Europe	218,834	145,956
Sweden	221,564	120,928
United Kingdom—		
England	234,904	114,548
Scotland	550	209
Canada	3,092,950	1,623,819
Dutch West Indies	50	44
Straits Settlements	450	220
Japan	27,137	17,687
Russia in Asia	1,107,496	520,768
Oceania—Australia	5,474	3,400
Totals, 1914-15	6,383,145	$3,361,107
Totals, 1913-14	3,747,749	2,398,150
Totals, 1912-13	5,272,387	4,476,379
Totals, 1911-12	5,610,951	4,890,905
Totals, 1910-11	5,267,588	5,439,282
Totals, 1909-10	6,492,947	7,629,380
Totals, 1908-09	3,791,971	2,964,496
Totals, 1907-08	4,110,667	2,994,208
Totals, 1906-07	4,215,350	3,593,912

RE-EXPORTS OF MANUFACTURES OF INDIA RUBBER.

TO—	VALUE.
France	$140
Germany	87
United Kingdom—	
England	392
Scotland	1,593
Canada	3,203
Central American States—Panama	6
Mexico	22
Newfoundland and Labrador	25
West Indies—Cuba	69
Oceania—Australia	1,952
Totals, 1914-15	$7,489
Totals, 1913-14	7,638
Totals, 1912-13	7,973
Totals, 1911-12	6,681
Totals, 1910-11	29,356
Totals, 1909-10	13,568
Totals, 1908-09	36,401
Totals, 1907-08	176,129
Totals, 1906-07	32,712

GUTTA PERCHA.

IMPORTS OF CRUDE GUTTA PERCHA (FREE).

FROM—	POUNDS.	VALUE.
Europe:		
France	35,482	$10,569
Germany	42,118	28,901
United Kingdom—		
England	46,218	10,395
Scotland	11,740	1,190
Totals, Europe	135,558	$51,055
North America:		
Canada	408	$90
Asia:		
British East Indies—		
Straits Settlements	1,334,124	$171,355
Dutch East Indies	145,800	7,885
Totals, Asia	1,479,924	$179,240
Oceania:		
Philippine Islands	2,324	$365
Totals, 1914-15	1,618,214	$230,750
Totals, 1913-14	1,846,109	323,567
Totals, 1912-13	480,853	167,313
Totals, 1911-12	1,204,406	225,797
Totals, 1910-11	1,648,921	390,548
Totals, 1909-10	784,501	167,873
Totals, 1908-09	255,559	82,136
Totals, 1907-08	188,610	100,305
Totals, 1906-07	546,890	201,339
Totals, 1905-06	500,770	188,161
Totals, 1904-05	665,217	210,188
Totals, 1903-04	424,617	174,953
Totals, 1902-03	316,290	222,400
Totals, 1901-02	525,767	252,329
Totals, 1900-01	280,560	130,957
Totals, 1899-00	427,678	178,616
Totals, 1898-99	518,939	167,577
Totals, 1897-98	636,477	159,381
Totals, 1896-97	1,117,665	100,187
Totals, 1895-96	3,843,854	178,513
Totals, 1894-95	1,326,794	122,261
Totals, 1893-94	498,763	84,340
Totals, 1892-93	582,378	155,428
Totals, 1891-92	308,239	114,874
Totals, 1890-91	960,835	164,524

IMPORTS OF MANUFACTURES OF GUTTA PERCHA (DUTIABLE).

FROM—	VALUE.
Europe:	
France	$511
Germany	7,069
Great Britain—	
England	3,006
Scotland	214
Totals, Europe	$10,800
North America:	
Canada	$40
West Indies—Other British	1
Totals, North America	$41
Totals, 1914-15	$10,841
Totals, 1913-14	42,023
Totals, 1912-13	77,300
Totals, 1911-12	41,098
Totals, 1910-11	61,283
Totals, 1909-10	80,567
Totals, 1908-09	71,819
Totals, 1907-08	93,545

RE-EXPORTS OF CRUDE GUTTA PERCHA.

TO—	POUNDS.	VALUE.
United Kingdom—England	5,997	$3,115
Canada	3,460	1,488
Totals, 1914-15	9,457	$4,603
Totals, 1913-14	14,649	5,255
Totals, 1912-13	22,352	2,665
Totals, 1911-12	1,011	945
Totals, 1910-11	62,391	19,235
Totals, 1909-10	74,137	13,886
Totals, 1908-09	9,370	3,730
Totals, 1907-08	.....	.....
Totals, 1906-07	5,000	700

GUAYULE GUM.

IMPORTS OF GUAYULE (FREE).

FROM—	POUNDS.	VALUE.
Mexico	5,111,849	$1,441,367
Totals, 1914-15	5,111,849	$1,441,367
Totals, 1913-14	1,475,804	607,076
Totals, 1912-13	10,218,191	4,345,088
Totals, 1911-12	14,238,625	6,463,787
Totals, 1910-11	19,749,522	10,443,157

RE-EXPORTS OF GUAYULE GUM.

To—	POUNDS.	VALUE.
Canada	29,891	$8,901
Totals, 1914-15	29,891	$8,901
Totals, 1913-14	56,399	22,378
Totals, 1912-13	83,769	54,669
Totals, 1911-12	197,948	98,517
Totals, 1910-11	340,405	175,995

(Not reported until 1910-11.)

GUTTA JELUTONG.

IMPORTS OF GUTTA JELUTONG (PONTIANAK) (FREE).

FROM—	POUNDS.	VALUE.
Europe:		
Germany	9,191	$991
England	66,080	5,993
Totals, Europe	75,271	$6,984
Asia:		
British East Indies—		
Straits Settlements	14,464,278	$708,706
Dutch East Indies	311,715	16,305
Totals, Asia	14,775,993	$725,011
Totals, 1914-15	14,851,264	$731,995
Totals, 1913-14	24,926,571	1,155,402
Totals, 1912-13	45,345,338	2,174,441
Totals, 1911-12	48,795,268	2,255,050
Totals, 1910-11	51,420,872	2,872,633
Totals, 1909-10	52,392,444	2,419,223
Totals, 1908-09	24,826,296	852,372
Totals, 1907-08	22,803,303	1,039,776
Totals, 1906-07	28,437,660	1,085,098
Totals, 1905-06	21,390,116	733,074
Totals, 1904-05	19,104,911	641,319
Totals, 1903-04	14,887,416	430,231
Totals, 1902-03	13,984,817	345,431
Totals, 1901-02	16,850,821	501,418
Totals, 1900-01	9,371,087	248,838
Totals, 1899-00	8,701,753	237,214
Totals, 1898-99	6,473,882	166,419

RE-EXPORTS OF GUTTA JELUTONG (PONTIANAK).

	POUNDS.	VALUE.
Totals, 1914-15	.....	.....
Totals, 1913-14	32,000	$2,000
Totals, 1912-13	3,000	163
Totals, 1911-12	118,486	6,079
Totals, 1910-11	.....	.....
Totals, 1909-10	2,139	112

BALATA.

IMPORTS OF BALATA (FREE).

FROM—	POUNDS.	VALUE.
Europe:		
France	4,272	$1,922
England	33,308	17,545
Totals, Europe	37,580	$19,467
North America:		
Cent. Amer. Sts.—Panama	577,128	$170,313
British West Indies—		
Barbados	1,949	1,200
Trinidad	96,739	36,924
Dutch West Indies	19,000	10,070
Totals, North America	694,816	$218,507
South America:		
Colombia	2,160	$626
Guiana—		
British	357,943	168,874
Dutch	443,080	255,731
French	44,089	19,955
Venezuela	892,556	280,224
Totals, South America	1,739,828	$725,410
Totals, 1914-15	2,472,224	$963,384
Totals, 1913-14	1,533,024	793,126
Totals, 1912-13	1,318,598	766,772
Totals, 1911-12	1,517,066	984,012
Totals, 1910-11	878,305	624,702
Totals, 1909-10	399,003	196,878
Totals, 1908-09	1,157,018	522,872
Totals, 1907-08	584,582	276,756
Totals, 1906-07	799,029	305,041
Totals, 1905-06	374,220	152,689

RE-EXPORTS OF BALATA.

To—	POUNDS.	VALUE.
Sweden	22,573	$10,609
United Kingdom—		
England	980,250	386,407
Scotland	69,544	28,519
Central American States—		
Panama	1,850	600
Colombia	2,402	600
Totals, 1914-15	1,076,619	$426,735
Totals, 1913-14	223,983	127,139
Totals, 1912-13	118,334	77,963
Totals, 1911-12	62,529	38,423
Totals, 1910-11	264,589	230,575
Totals, 1909-10	.....	42,750
Totals, 1908-09	.....	223,907
Totals, 1907-08	.....	18,741
Totals, 1906-07	.....	12,659

SCRAP RUBBER

IMPORTS OF SCRAP AND REFUSE RUBBER (FREE).

FROM—	POUNDS.	VALUE.
Europe:		
Austria-Hungary	2,240	$154
Belgium	76,471	3,106
Bulgaria	44,800	3,200
Denmark	34,230	3,405
France	728,164	51,611
Germany	319,921	15,108
Italy	142,835	31,389
Netherlands	75,886	4,295
Norway	21,508	1,472
Russia in Europe	503,163	44,557
Spain	6,980	431
Sweden	257,024	19,254
Switzerland	21,190	1,494
Turkey in Europe	143,943	9,343
United Kingdom—England	3,820,491	242,926
Totals, Europe	6,198,846	$431,745
North America:		
British Honduras	1,600	$217
Canada	4,286,195	265,491
Central American States—		
Costa Rica	3,559	303
Panama	17,518	900
Mexico	65,227	5,659
Newfoundl'd and Labrador	36,066	2,385
British West Indies—		
Barbados	3,000	125
Jamaica	5,256	294
Other British	204	10
Cuba	190,966	9,056
Totals, North America	4,609,591	$284,440
South America:		
Brazil	5,926	$108
Colombia	1,841	150
Venezuela	3,434	210
Totals, South America	11,201	$468
Asia:		
China	36,110	$2,729
British India	37,488	2,999
Dutch East Indies	2,622	96
Hongkong	22,400	894
Japan	5,150	139
Russia in Asia	13,726	839
Totals, Asia	117,496	$7,696
Oceania:		
Australia	36,345	$1,468
New Zealand	33,449	1,097
Totals, Oceania	66,794	$2,565
Totals, 1914-15	11,006,928	$726,915
Totals, 1913-14	25,958,261	2,063,198
Totals, 1912-13	43,385,456	3,709,238
Totals, 1911-12	26,293,192	2,095,605
Totals, 1910-11	26,948,000	2,334,870
Totals, 1909-10	37,364,671	2,998,697
Totals, 1908-09	20,497,695	1,543,267
Totals, 1907-08	16,331,035	1,496,822
Totals, 1906-07	29,335,193	2,608,987
Totals, 1905-06	24,756,486	1,721,678
Totals, 1904-05	15,575,214	953,439
Totals, 1903-04	20,270,970	1,164,785
Totals, 1902-03	24,659,394	1,516,137
Totals, 1901-02	22,894,900	1,437,690
Totals, 1900-01	15,235,236	988,316
Totals, 1899-00	19,093,547	1,249,231
Totals, 1898-99	10,513,604	462,044
Totals, 1897-98	9,488,327	339,374
Totals, 1896-97	3,653,945	113,722
Totals, 1895-96	3,874,677	123,068
Totals, 1894-95	2,032,563	63,112
Totals, 1893-94	1,774,008	55,803
Totals, 1892-93	910,543	25,633
Totals, 1891-92	1,841,786	66,775

EXPORTS OF SCRAP AND REFUSE RUBBER.

To—	POUNDS.	VALUE.
Europe:		
Austria-Hungary	2,616	$441
Belgium	1,020	200
France	138,714	18,902
Germany	38,775	9,163
Italy	38,874	3,797
Netherlands	13,426	2,033
Sweden	78,521	13,898
United Kingdom—		
England	1,025,793	136,704
Scotland	450,645	51,129
Totals, Europe	.....	$236,267
North America:		
Canada	603,564	$53,805
Asia:		
Japan	30,143	$1,349
Totals, 1914-15	2,422,091	$291,421
Totals, 1913-14	6,207,672	598,287
Totals, 1912-13	7,269,465	880,442
Totals, 1911-12	7,336,984	780,188
Totals, 1910-11	7,049,729	723,664
Totals, 1909-10	6,143,610	578,944
Totals, 1908-09	4,071,795	402,897
Totals, 1907-08	4,255,789	449,727
Totals, 1906-07	4,756,621	548,695
Totals, 1905-06	*a*	339,507
Totals, 1904-05	*a*	204,945

(*a*) Not officially reported.

RE-EXPORTS OF SCRAP RUBBER.

To—	POUNDS.	VALUE.
United Kingdom—England	3,483	$373
Totals, 1914-15	3,483	$373
Totals, 1913-14	24,295	2,450
Totals, 1912-13	87,930	10,723
Totals, 1911-12	302,105	28,196
Totals, 1910-11	401,231	43,338
Totals, 1909-10	61,395	5,373
Totals, 1908-09	38,506	2,093
Totals, 1907-08	21,713	2,943
Totals, 1906-07	105,463	9,444

RECLAIMED RUBBER.

EXPORTS OF RECLAIMED RUBBER.

To—	POUNDS.	VALUE.
Europe:		
Belgium	6,685	$1,300
France	295,619	37,822
Germany	10,608	1,436
Italy	21,243	2,466
Norway	24,779	3,551
Sweden	4,571	694
United Kingdom—		
England	886,072	134,200
Scotland	90,807	13,550
Totals, Europe	1,340,384	$195,019
North America:		
Canada	4,511,317	$610,467
Panama	10	2
Totals, North America	4,511,327	$610,469
South America:		
Brazil	1,507	$291
Asia:		
Japan	116,657	$16,731
Oceania:		
Philippine Islands	505	$51
Totals, 1914-15	5,970,380	$822,561
Totals, 1913-14	5,583,860	834,440
Totals, 1912-13	5,413,247	932,904
Totals, 1911-12	5,397,806	875,501
Totals, 1910-11	4,994,527	781,650
Totals, 1909-10	3,622,556	535,795
Totals, 1908-09	3,196,551	414,861
Totals, 1907-08	2,947,974	418,738
Totals, 1906-07	4,550,788	665,109
Totals, 1905-06	4,084,696	511,843
Totals, 1904-05	*a*	522,902

(*a*) Not officially reported.

SUBSTITUTES, ELASTICON, ETC.

IMPORTS OF ELASTICON AND SIMILAR SUBSTITUTES FOR INDIA RUBBER (DUTIABLE).

FROM—	VALUE.
Europe:	
England	$28,170
France	1,260
Germany	919
Totals, Europe	$30,349
Totals, 1914-15	$30,349
Totals, 1913-14	87,642
Totals, 1912-13	97,452
Totals, 1911-12	87,328
Totals, 1910-11	115,601
Totals, 1909-10	114,516
Totals, 1908-09	60,625
Totals, 1907-08	27,000

RE-EXPORTS SUBSTITUTES, ELASTICON, ETC.

To—	VALUE.
United Kingdom—England	$345
Mexico	19
Totals, 1914-15	$364

EXPORTS OF AMERICAN RUBBER GOODS, FISCAL YEAR ENDED JUNE 30, 1915.

EXPORTED TO—	Belting, Hose and Packing. Value.	Boots.		Shoes.		Tires.		Other goods, value.	Total value.
		Pairs.	Value.	Pairs.	Value.	Automobile, value.	Other, value.		
Austria-Hungary	.....	.....	.....	888	$558	.....	.....	$175	$733
Azores and Madeira Islands	$70	.....	.....	.....	.....	$178	$566	549	1,363
Belgium	73	.....	.....	10,524	5,788	.....	.....	2,419	8,280
Bulgaria	.....	.....	.....	.....	.....	150	.....	.....	150
Denmark	3,710	.....	.....	60,867	29,432	12,288	2,988	24,530	72,948
Finland	1,743	.....	.....	.....	.....	.....	270	100	2,113
France	6,900	24,187	$40,204	761,402	1,254,228	8,723	359	87,811	1,398,225
Germany	2,495	.....	.....	5,356	2,936	6,090	.....	37,032	48,553
Gibraltar	.....	.....	.....	1,395	916	.....	.....	.....	916
Greece	328	880	1,495	.....	.....	2,680	1,525	1,377	7,405
Italy	5,846	254	749	41,637	24,247	11,740	31,293	30,806	104,681
Netherlands	1,342	.....	.....	12,077	5,661	1,907	102	14,290	23,302
Norway	3,249	.....	.....	54,686	28,985	7,394	2,762	4,475	46,865
Portugal	1,094	.....	.....	48	40	1,434	1,013	1,111	4,692
Russia in Europe	945	.....	.....	.....	.....	6,480	.....	5,191	12,616
Serbia, Montenegro, etc.	100	.....	.....	.....	.....	.....	.....	108	208
Spain	2,851	.....	.....	51,951	26,797	2,408	1,123	3,835	37,014
Sweden	1,319	.....	.....	1,115	525	26,707	14,939	8,915	52,405
Switzerland	.....	4	9	17,126	8,667	.....	.....	2,079	10,746
Turkey in Europe	.....	.....	.....	13,750	6,970	1,927	.....	13	8,910
United Kingdom—									
England	271,708	231,688	518,643	62,039	360,310	2,655,099	190,597	1,550,567	5,546,924
Scotland	7,554	206	268	31,218	12,458	245	.....	42,511	63,036
Ireland	127	.....	.....	1,702	779	.....	.....	254	1,160
Totals, Europe	$311,454	257,219	$561,368	1,727,781	$1,769,297	$2,745,450	$247,537	$1,818,139	$7,453,245
NORTH AMERICA:									
Bermuda	$611	5	$11	623	$394	$139	$342	$2,569	$4,066
British Honduras	733	.....	.....	39	40	64	89	2,665	3,591
Canada	247,114	22,928	66,237	32,252	27,011	772,574	13,888	787,970	1,914,794
Central American States—									
Costa Rica	5,143	.....	.....	30	16	2,381	1,759	4,815	14,114
Guatemala	8,832	2	5	159	80	3,406	959	3,279	16,561
Honduras	6,828	.....	.....	92	47	3,229	363	4,550	15,019
Nicaragua	3,296	36	90	181	385	419	688	5,110	9,988
Panama	37,982	1	5	7,178	6,487	24,549	15,467	29,706	114,196
Salvador	5,931	.....	.....	.....	.....	2,617	73	16,653	25,274
Mexico	168,336	33	138	87	53	106,083	19,935	50,128	344,673
Miquelon, Langley, etc.	61	1,019	2,649	1,462	790	.....	.....	38	3,538
Newfoundland and Labrador	8,002	14,375	33,265	70,843	35,514	4,034	855	6,870	88,540
West Indies—British—									
Barbados	265	.....	.....	.....	.....	4,136	7	895	5,303
Jamaica	5,915	7	18	60	36	36,887	12,570	6,229	61,655
Trinidad and Tobago	6,887	.....	.....	2,994	2,598	22,672	1,578	4,580	38,315
Other British	2,239	2	4	48	33	3,327	1,265	2,196	9,064
Cuba	109,425	642	1,581	2,843	1,536	192,355	70,832	178,459	554,188
Danish	265	12	33	36	33	577	548	454	1,910
Dutch	199	.....	.....	95	61	3,068	194	851	4,373
French	318	.....	.....	6	8	1,527	573	2,022	4,448
Haiti	724	24	61	19	11	526	117	978	2,417
Santo Domingo	8,590	1	3	330	224	3,062	4,082	5,877	21,838
Totals, North America	$627,696	39,087	$104,100	119,377	$75,357	$1,187,632	$146,186	$1,116,894	$3,257,865
SOUTH AMERICA:									
Argentina	$28,215	246	$779	21,878	$10,580	$34,096	$7,439	$75,869	.....
Bolivia	805	.....	.....	.....	.....	3,413	205	145	.....
Brazil	23,719	133	335	8,096	4,677	77,425	8,833	67,567	.....
Chile	107,006	1,276	4,172	4,387	3,144	21,353	17,250	27,653	.....
Colombia	8,593	12	53	776	336	15,239	4,567	9,423	.....
Ecuador	3,914	.....	.....	696	272	8,620	367	7,387	.....
Guiana—									
British	1,227	.....	.....	3,955	1,833	3,884	1,198	1,617	.....
Dutch	273	.....	.....	238	215	308	.....	474	.....
French	.....	.....	.....	.....	.....	.....	26	.....	.....
Paraguay	.....	.....	.....	.....	.....	16	.....	1	.....
Peru	19,977	440	2,299	1,330	711	5,253	2,616	9,418	.....
Uruguay	4,327	47	162	14,270	7,719	11,826	7,146	18,504	.....
Venezuela	7,167	.....	.....	419	263	32,635	750	12,380	.....
Totals, South America	$205,223	2,154	$7,800	56,045	$29,750	$214,068	$50,397	$230,138	.....
ASIA:									
Aden	.....	.....	.....	.....	.....	$264	.....	$48	.....
China	$18,297	14	$62	317	$260	18,971	$2,448	9,108	.....
China, leased territory—									
French	.....	.....	.....	.....	.....	.....	.....	.....	.....
Japanese	335	.....	.....	84	41	.....	.....	13	.....
Chosen	6,192	3	14	35	35	2,189	.....	66	.....
East Indies—British—									
British India	15,797	.....	.....	712	362	15,441	498	13,913	.....
Straits Settlements	764	.....	.....	.....	.....	8,595	289	3,660	.....
Other British	113	.....	.....	.....	.....	1,883	273	.....	.....
East Indies—Dutch	1,997	.....	.....	.....	.....	7,688	804	1,670	.....
Hongkong	3,099	25	74	.....	.....	879	5,166	3,678	.....
Japan	38,520	752	1,227	20,623	11,032	12,741	3,558	55,645	.....
Russia in Asia	1,512	2	14	.....	.....	.....	.....	4,406	.....
Siam	6	.....	.....	3	2	742	32	237	.....
Turkey in Asia	1,240	.....	.....	20,012	9,523	4,037	.....	.....	.....
Totals, Asia	$87,872	796	$1,391	41,786	$21,255	$73,430	$13,068	$92,444	.....

EXPORTED TO—	Belting, Hose and Packing. Value.	Boots. Pairs.	Boots. Value.	Shoes. Pairs.	Shoes. Value.	Tires. Automobile, value.	Tires. Other, value.	Other goods, value.	Total value.
EUROPE:									
OCEANIA:									
British Oceania—									
Australia and Tasmania	$132,202	6,694	$15,952	199,694	$108,060	$245,240	$4,450	$83,651	.....
New Zealand	38,994	9,217	27,298	27,955	15,514	201,379	11,475	31,966	.....
Other British	71	25	76	6,051	5,069	164	.....	44	.....
French Oceania	875	.....	.....	5,553	5,196	5,262	800	429	.....
German Oceania	114	.....	.....	161	169	.....	102	77	.....
Philippine Islands	58,606	550	1,600	22,315	20,419	250,832	81,914	120,277	.....
Totals, Oceania	$230,862	16,486	$44,926	261,729	$154,427	$702,877	$98,741	$236,442	.....
AFRICA:									
British Africa—									
West	$2,894	.....	.....	.....	.....	$1,149	$200	$66	.....
South	304,430	2,925	$6,993	13,182	$3,474	32,822	20,405	28,317	.....
East	3	.....	.....	.....	.....	4,823	.....	.....	.....
Canary Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....
Egypt	80	.....	.....	.....	.....	63	.....	2,046	.....
French Africa	.....	.....	.....	.....	.....	.....	68	.....	.....
German Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....
Liberia	2,065	.....	.....	.....	.....	.....	.....	15	.....
Morocco	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portuguese Africa	40,069	60	187	.....	.....	946	.....	585	.....
Totals, Africa	$344,741	2,985	$7,180	13,182	$3,474	$39,813	$20,673	$31,429	.....
Grand totals, 1914-15	$1,807,848	318,727	$726,765	2,219,900	$2,053,560	$4,963,270	$576,602	$3,525,486	.....
Grand totals, 1913-14	2,372,887	101,361	279,206	1,634,258	834,289	3,505,267	563,372	3,453,472	$11,008,493
Grand totals, 1912-13	2,605,551	109,528	274,330	2,231,467	1,163,953	3,943,220	611,458	3,913,036	12,511,548

		Boots and Shoes.[1] Pairs.	Boots and Shoes.[1] Value.					
Grand totals, 1911-12	2,315,484	.....	2,545,076	$1,502,890	.....	2,657,809	546,833	4,144,273	11,167,289
Grand totals, 1910-11	2,163,416	.....	3,984,332	2,219,430	.....	2,085,107[2]	592,470	3,886,825	10,947,248
Grand totals, 1909-10	1,960,825	.....	3,791,084	1,984,739	.....	.....	.....	5,115,331	9,060,895
Grand totals, 1908-09	1,498,445	.....	2,396,435	1,292,673	.....	.....	.....	3,823,956	6,615,074
Grand totals, 1907-08	1,347,775	.....	3,080,253	1,614,290	.....	.....	.....	3,743,040	6,705,105
Grand totals, 1906-07	1,253,369	.....	2,310,420	1,231,898	.....	.....	.....	3,729,643	6,214,910
Grand totals, 1905-06	1,221,159	.....	2,693,690	1,505,082	.....	.....	.....	2,966,144	5,692,385
Grand totals, 1904-05	994,100	.....	2,390,539	1,214,342	.....	.....	.....	2,572,375	4,780,817
Grand totals, 1903-04	880,010	.....	2,310,420	1,231,898	.....	.....	.....	3,729,643	6,214,910
Grand totals, 1902-03	819,985	.....	2,307,401	1,056,491	.....	.....	.....	2,299,875	4,176,351
Grand totals, 1901-02	634,146	.....	2,594,708	1,046,315	.....	.....	.....	1,781,941	3,462,402
Grand totals, 1900-01	565,726	.....	1,459,100	724,015	.....	.....	.....	1,727,527	3,017,268

[1] Stated separately after 1912. [2] Tires were not specifically reported before 1910-11.

SUMMARY.

	1912-13. Pounds.	1912-13. Value.	1913-14. Pounds.	1913-14. Value.	1914-15. Pounds.	1914-15. Value.
IMPORTS OF FOREIGN MERCHANDISE—						
India rubber, etc., and substitutes for, and manufactures of:						
Unmanufactured—(*free*):						
Balata	1,318,598	$766,772	1,533,024	$793,126	2,472,224	$963,384
Guayule gum	10,218,191	4,345,088	1,475,804	607,076	5,111,849	1,441,367
Gutta jelutong	45,345,338	2,174,441	24,926,571	1,155,402	14,851,264	731,995
Gutta percha	480,853	167,313	1,846,109	323,567	1,618,274	230,750
India rubber	113,384,359	90,170,316	131,995,742	71,219,851	172,068,428	83,030,269
India rubber scrap or refuse, fit only for remanufacture	43,385,456	3,709,238	25,958,261	2,063,198	11,006,928	726,915
Total unmanufactured imports	214,132,795	$101,333,168	187,735,511	$76,162,220	207,128,907	$87,124,680
Manufactures of—(*dutiable*):						
Gutta percha	.....	$77,300	.....	$42,023	.....	$10,841
India rubber	.....	1,217,236	.....	1,517,789	.....	791,281
Substitutes, elasticon and similar	.....	97,452	.....	87,642	.....	30,349
Total manufactured imports	.....	$1,391,988	.....	$1,647,454	.....	$832,471
RE-EXPORTS OF FOREIGN MERCHANDISE—						
India rubber, etc., and substitutes for, and manufactures of:						
Unmanufactured—(*free*):						
Balata	118,334	$77,963	223,983	$127,139	1,076,619	$426,735
Guayule gum	83,769	54,669	56,399	22,378	29,891	8,901
Gutta jelutong	3,000	163	32,330	2,195	.....	.....
Gutta percha	22,352	2,665	14,319	5,060	9,457	4,603
India rubber	5,272,387	4,476,379	3,747,749	2,398,150	6,383,145	3,361,107
India rubber scrap or refuse, fit only for remanufacture	87,930	10,723	24,316	2,450	3,483	373
Total unmanufactured re-exports	5,587,772	$4,622,562	4,099,096	$2,557,372	7,502,595	$3,801,719
Manufactures of—(*dutiable*):						
Gutta percha	.....	$27,906	.....	.....	.....	.....
India rubber	.....	7,973	.....	$7,638	.....	$7,489
Substitutes, elasticon and similar	.....	559	.....	.....	.....	364
Total manufactures re-exported	.....	$36,438	.....	$7,638	.....	$7,853
EXPORTS OF DOMESTIC MANUFACTURES—						
India rubber, manufactures of:						
Scrap and old	7,269,465	$880,442	6,207,672	$598,287	2,422,091	$291,421
Reclaimed	5,413,247	932,904	5,583,860	834,440	5,970,380	822,561
Belting, hose and packing	.....	2,605,551	.....	2,372,887	.....	1,807,848
Boots and shoes—						
Boots (*pairs*)	109,528	274,330	101,361	279,206	318,727	726,765
Shoes	2,231,467	1,163,953	1,634,258	834,289	2,219,900	2,053,560
Tires—						
For automobiles	.....	3,943,220	.....	3,505,267	.....	4,963,270
All other	.....	611,458	.....	563,372	.....	576,602
All other manufactures of	.....	3,913,036	.....	3,453,472	.....	3,525,486
Total domestic manufactures exported	.....	$14,324,894	.....	$12,441,220	.....	$14,767,513

Review of the Crude Rubber Market.

NEW YORK.

THE crude rubber market has been decidedly quiet in all quarters during the month of April. True, there have been a few large orders placed, but, in general, trading has been quietly done in small lots, and prices have steadily declined. The big buying interests seem to have deserted the April market.

The direct shipments to America from the East by way of the Pacific coast still continue in large volume. From January 31 to February 14, inclusive, there were 779,715 pounds shipped from Penang. From Singapore 5,030,412 pounds were shipped between February 7-27, making a total of 5,810,127 pounds now arriving at the Pacific ports. Pacific shipments are not entirely satisfactory, as more time is required than by the Cape route, averaging about a month longer. Akron shipments, however, are favored, as they are not affected by the eastern freight congestion.

The arrivals at New York, compared to 6,000 tons for the first three weeks of March, are falling off as indicated by the figures for April 1 to 18, inclusive, which total 3,700 tons and are divided as follows: Plantations from London and Liverpool, 600 tons; Singapore and Colombo, 1,715 tons; Batavia, Java, 595 tons; Para and Manaos, 335 tons; Africans, 260 tons; Centrals, 125 tons; Manicoba, 70 tons.

The steamship "Suldanha da Gama," overdue in New York with 120 tons of rubber, was captured off the Orkney Islands last month by a British cruiser.

Early in the month First latex spot, was selling at 85½@86½ cents, and Smoked sheet, ribbed spot, was 84½@85½ cents. May-June deliveries of these grades were quoted from ½ to 1 cent less than spot prices. Upriver fine spot, and May deliveries were quoted at 73½ cents.

The downward trend of prices continued with minor fluctuations during the month, and on April 25 First latex spot, was quoted at 80 cents, smoked sheet ribbed spot, at 79 cents, and Upriver fine, 71 cents.

LONDON.

The inquiry was fair during the early part of April, with small lots of Standard crepe spot, going at 3*s.* 4¾*d.* [82.6 cents], and Smoked sheet spot, at 3*s.* 4¼*d.* [81.5 cents]. May-June deliveries were at a ¼*d.* premium for both grades. Sellers of Hard fine Para were asking 3*s.* 1*d.* [75 cents]. On April 25 Standard crepe spot sold for 37½*d.* [75 cents] and Smoked sheet for 37*d.* [74 cents], an average decline of 7 cents the pound since April 1.

The absence of large buyers was marked during the entire month, and consequently the market lacked the support necessary to hold up prices. The diversion of shipments to America via Pacific routes, the increase of ocean rates and the advance in war risks, have had a disquieting effect on London.

The consumption of crude rubber in the United Kingdom for the past three years has steadily declined, according to figures furnished by the London Board of Trade. In 1915 the quantity of crude rubber retained in England for home consumption was 17,982 tons, as compared to 18,850 tons in 1914 and 25,275 tons in 1913.

SINGAPORE.

At the auction held March 1-2, 1,274,000 pounds were offered and 619,733 pounds sold. Fine pale crepe brought 79½ cents, and Smoked sheet ribbed sold for 79 cents. On March 8-9, of 1,137,600 pounds offered, 845,333 pounds were sold. Fine pale crepe went readily at 79 cents, and Smoked sheet ribbed sold up to 80 cents. The market closed firm and active. The auction, March 15-16, brought out 972,666 pounds, 778,800 pounds being sold. Fine pale crepe sold at 80 cents, and Smoked sheet ribbed at 79 cents. The market was steady at the close.

SINGAPORE-NEW YORK FREIGHT RATES.

The following are the new freight rates from Singapore to Boston and New York via the Suez or Panama Canal:

Rubber scrap (cases)	$48.60 per 50 cubic feet
Gutta jelutong (cases) (Pontianak)	52.24 per 50 cwt.
Rubber shavings, not exceeding $300 per ton (cases)	53.46 per 50 cubic feet
Gutta re-boiled or mixed, not exceeding 24 cents per pound (c. i. f. in cases)	55.89 per 50 cubic feet
Borneo rubber (baskets)	65.61 per 12 cwt.
Borneo, Para, and rubber, genuine (cases)	65.61 per 50 cubic feet
Gutta percha (cases)	68.04 per 50 cubic feet
Rubber, genuine (bags or bundles)	97.20 per 20 cwt.

The new through rate on rubber in cases from Port Swettenham, Malacca, Teluk Anson, Port Dickson, is $79.25 per 50 cubic feet. In cases by steamers calling at Port Swettenham is $65.61 per 50 cubic feet. [The equivalent of a ton (2,240 pounds) is figured at 40 cubic feet, a hundred weight (cwt.) 112 pounds.]

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and April 28, the current date:

	May 1, '15.	April 1, '16.	April 28, '16.
PARA.			
Upriver, fine, new	60 @	74 @ 74½	70 @ 70½
Upriver, fine, old	62 @		
Islands, fine, new	53 @	70 @	64½@
Islands, fine, old			
Upriver, coarse, new	46 @	57½@	54½@ 55
Upriver, coarse, old			
Islands, coarse, new	30 @	38 @	34½@
Islands, coarse, old			
Cameta		40 @	38½@
Caucho, ball, upper	48 @	59 @	56 @
Caucho, ball, lower	45 @	55 @	54 @
PLANTATION.			
First latex crêpe. Spot	58½@ Spot	88 @	Spot 78½@79
First latex crêpe. Afloat	57 @		May-June 78½@79
Amber crêpe, light			Spot 76½@77
			May-June
Brown crêpe, clean			Spot 75½@76
			May-June
Smoked sheet, ribbed Spot	59 @		Spot 78@78½
Smoked sheet, ribbed Afloat	58 @ Spot	87½@	May-June 78@78½
Fine sheets and biscuits, unsmoked		82 @	Spot @
CENTRALS.			
Corinto	46 @	58 @	51 @
Esmeralda, sausage	45 @	58 @	50 @ 50½
Nicaragua, scrap	44 @	57 @	50 @
Mexican plantation, sheet			64 @ 65
Mexican, scrap	46 @		48 @ 49
Mexican, slab		41 @	36 @ 37
Manicoba	37½@	48 @ 50	47 @
Mangabeira, sheet	37½@	40 @ 42	42 @
Guayule	28 @ 29		38 @ 39
Balata, sheet	55 @	70 @ 71	67 @
Balata, block	48 @	44 @ 58	54 @
AFRICAN.			
Lopori, ball, prime		75 @	70 @
Lopori, strip, prime			
Upper Congo, ball, red		63 @	68 @
Rio Nunez Niggers		73 @	67 @
Conakry Niggers		72 @	72 @
Massai, red	54 @	72 @	68 @ 69
Soudan, Niggers			
Cameroon, ball, soft			
Cameroon, ball, hard			
Benguela, No. 1	30 @	50 @	48 @
Benguela, No. 2		46 @	42 @ 44
Accra, flake	23 @	41 @	38 @
EAST INDIAN.			
Assam	50 @	55 @	
Pontianak	7½@	10½@	10½@
Gutta Siak		16 @	17 @
Gutta red Niger		27 @	27 @
Borneo III		35 @	30 @
Gutta Percha		1.50 @2.00	1.50 @2.00

RUBBER AFLOAT TO THE UNITED STATES.

FROM PENANG.

Steamship.	Cleared.	To.	Pounds.
Kathlamba	Jan. 31, 1916	New York	223,066
Alcinous	Feb. 8, 1916	*New York	8,933
Alcinous	Feb. 8, 1916	*Akron	8,933
Demodocus	Feb. 9, 1916	*New York	11,200
Nore	Feb. 13, 1916	†New York	22,000
Tuscan Prince	Feb. 14, 1916	New York	485,450
Tuscan Prince	Feb. 14, 1916	Boston	20,133
Totals from Penang			779,715

FROM SINGAPORE.

Steamship.	Cleared.	To.	Pounds.
Hong Moh	Feb. 7, 1916	New York	172,966
Tuscan Prince	Feb. 11, 1916	New York	685,600
Demodocus	Feb. 12, 1916	Akron	100,666
Yangtsze	Feb. 12, 1916	New York	11,333
Alcinous	Feb. 13, 1916	Seattle	708,266
Alcinous	Feb. 13, 1916	Akron	216,666
Nankin	Feb. 15, 1916	New York	210,933
Nore	Feb. 16, 1916	New York	26,666
Nore	Feb. 16, 1916	Akron	141,200
Glenstrae	Feb. 17, 1916	Akron	52,666
Helenus	Feb. 19, 1916	New York	22,400
Ceylon Maru	Feb. 21, 1916	Akron	27,200
Indra	Feb. 22, 1916	Boston	8,933
Indra	Feb. 22, 1916	New York	1,772,133
Novara	Feb. 23, 1916	‡Seattle	111,986
Machaon	Feb. 27, 1916	Seattle	24,666
Machaon	Feb. 27, 1916	Akron	180,000
Machaon	Feb. 27, 1916	New York	4,533
Welsh Prince	Feb. 27, 1916	Boston	4,533
Welsh Prince	Feb. 27, 1916	New York	547,066
Totals from Singapore			5,030,412

GUTTA JELUTONG (PONTIANAK).

FROM SINGAPORE.

Hong Moh	Feb. 8, 1916	*San Francisco	27,200
Tuscan Prince	Feb. 11, 1916	Boston	155,211
Tuscan Prince	Feb. 11, 1916	New York	331,590
Demodocus	Feb. 12, 1916	Seattle	39,466
Indra	Feb. 22, 1916	Boston	112,933
Indra	Feb. 22, 1916	New York	392,533
Machaon	Feb. 27, 1916	Seattle	223,866
Welsh Prince	Feb. 27, 1916	Boston	86,400
Welsh Prince	Feb. 27, 1916	New York	424,266
Totals from Singapore			1,793,465

GUTTA PERCHA.

FROM SINGAPORE.

Tuscan Prince	Feb. 11, 1916	Boston	22,400
Tuscan Prince	Feb. 11, 1916	New York	70,133
Indra	Feb. 22, 1916	New York	55,966
Welsh Prince	Feb. 27, 1916	New York	45,200
Totals from Singapore			193,699

BORNEO.

FROM SINGAPORE.

Tuscan Prince	Feb. 11, 1916	New York	11,720
Indra	Feb. 21, 1916	New York	11,200
Totals from Singapore			22,920

*Via Hongkong. †Via Singapore. ‡Via Kobe.

GUTHRIE & CO., LIMITED, REPORT (MARCH, 1916).

	In Singapore. per picul.*	Sterling equivalent per pound in London.	Equivalent per pound in cents.†
Sheet, fine ribbed smoked	$178@185	3/ 4 7/16@3/ 6 1/16	82.85@85.89
Sheet, good ribbed smoked	170@177	3/ 3 9/16@3/ 4 5/16	80.32@82.35
Sheet, plain smoked	168@176	3/ 2 3/16@3/ 4 1/16	78.55@82.10
Sheet, ribbed, unsmoked	161@174	3/ 1 1/16@3/ 4	75.51@81.08
Sheet, plain, unsmoked	153@178	2/11 15/16@3/ 4 5/16	72.21@82.35
Crêpe, fine pale	184@186	3/ 6 1/16@3/ 6 5/16	85.39@85.39
Crêpe, good pale	175@182	3/ 4 1/16@3/ 5 3/16	81.59@84.63
Crêpe, fine brown	174@180	3/ 4 @3/ 5 1/16	81.08@83.62
Crêpe, good brown	157@175	3/ 0 15/16@3/ 4 1/16	73.99@81.59
Crêpe, dark	150@165	2/11 @3/ 2 13/16	70.95@77.28
Crêpe, bark	135@161	2/ 7 15/16@3/ 1 1/16	64.10@75.51
Scrap, virgin	110@137	2/ 2 13/16@2/ 8 1/16	53.97@65.37
Scrap, loose	137@...	2/ 8 1/16@.....	65.37@.....

* Picul = 133⅓ pounds.
† Figured at standard rate of exchange, 1s. = 24.3 cents.
Quoted in S. S. dollars = 2/4 [56 cents].

MARKET CABLE SERVICE FROM SINGAPORE.

The following reports of the weekly auctions held at Singapore have been cabled by the Waterhouse Co., Limited:

Date.	Crêpe. Price per lb.	Smoked Sheet. Price per lb.	Pounds Sold.	Market.
March 30	*cents* 79.5	80.3	692,160	Firm—improved demand.
April 5	76.5	76.5	414,400	Weak.
April 19	75	73.5	504,000	Weaker—less demand.

COMPARATIVE NEW YORK PRICES FOR APRIL.

	1916.*	1915.	1914.
Upriver fine	$0.72@0.74	$0.57@0.60	$0.74@0.76
Upriver coarse	.55@ .57	.46@ .48	.44@ .47
Islands fine	.65@ .69	.52@ .55	.69@ .73
Islands coarse	.36@ .40	.30@ .33	.31@ .34
Cametá	.38@ .40	.33@ .37	.35@ .37

*Figured only to April 25.

Crude Rubber Arrivals at the Port of New York.

[The Figures Indicate Weights in Pounds.]

MARCH 31.—By the steamer *Rio de Janeiro* from Pará:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Meyer & Brown	37,000	3,600	25,000	50,100=	115,700
G. Amsinck & Co.	126,500	7,200	54,100	60,200=	248,000
Arnold & Zeiss	88,200	15,800	30,500	33,800=	168,300
Henderson & Korn	100	2,400	53,000	2,800=	58,300
Aldens' Successors, Ltd.	3,000	750	15,100	4,370=	23,220
H. A. Astlett & Co.	7,100	.....	2,100	3,700=	12,900
W. R. Grace & Co.	4,200	.....	200	.....=	4,400
Totals	266,100	29,750	180,000	154,970=	630,820

MARCH 31.—By the steamer *Francis* from Pará and Manáos:

Meyer & Brown	166,400	18,100	306,000	219,400=	709,900
Arnold & Zeiss	281,600	39,100	142,600	94,500=	557,800
W. R. Grace & Co.	97,900	700	18,800	166,100=	283,500
Paul Bertuch	180,100	700	57,200	33,600=	271,600
G. Amsinck & Co.	91,000	14,500	50,900	113,800=	270,200
H. A. Astlett & Co.	79,100	20,700	104,700	47,100=	251,600
Henderson & Korn	115,300	29,800	47,400	20,200=	212,700
General Rubber Co.	153,900	18,000	27,100	.....=	199,000
Robinson & Co.	92,300	15,100	56,200	51,200=	214,800
Edward Maurer Co., Inc.	58,100	2,500	8,500	.....=	69,100
Pell & Dumont	45,000	900	18,400	.....=	64,300
Neuss, Hesslein & Co.	56,800	.....	3,500	1,000=	61,300
Hagemeyer & Brunn	13,000	12,000	15,200	.....=	40,200
J. T. Johnstone & Co.	.....	.....	43,000	.....=	43,000
F. B. Ross & Co.	5,800	1,000	11,200	.....=	18,000
A. D. Straus & Co.	21,100	.....	.....	.....=	21,100
Aldens' Successors, Ltd.	.....	2,200	5,300	.....=	7,500
Totals	1,457,400	175,300	916,000	746,900=	3,295,600

APRIL 15.—By the steamer *Minas Geraes* from Pará:

Meyer & Brown	91,200	13,200	76,200	29,400=	210,000
General Rubber Co.	65,500	8,300	74,000	.....=	147,800
G. Amsinck & Co.	30,500	7,600	13,400	74,000=	125,500
Arnold & Zeiss	80,400	12,000	31,300	500=	124,200
Muller, Schall & Co.	.....	.....	.....	20,100=	20,100
Henderson & Korn	1,100	2,100	12,400	1,600=	17,200
H. A. Astlett & Co.	4,300	.....	9,000	.....=	13,300
P. Bertuch	10,000	1,100	.....	.....=	11,100
Totals	283,000	44,300	216,300	125,600=	669,200

PARAS.

		Pounds.
MARCH 23.—By the *Allianca*=Colon:		
G. Amsinck & Co. (Fine)	5,000	
G. Amsinck & Co. (Caucho)	2,000	
G. Amsinck & Co. (Coarse)	1,000	
Neuss, Hesslein & Co. (Fine)	4,000	
Neuss, Hesslein & Co. (Coarse)	2,000	14,000
MARCH 27.—By the *Raphael*=Montevideo:		
A. D. Straus & Co. (Fine)	8,000	
A. D. Straus & Co. (Coarse)	1,500	9,500
APRIL 10.—By the *Ancon*=Colon:		
W. R. Grace & Co (Fine)	4,500	
W. R. Grace & Co. (Coarse)	1,000	5,500

CENTRALS.

[*This sign, in connection with imports of Centrals, denotes Guayule rubber.]

MARCH 21.—By the *Tivives*=Cortez.		
M. Keith	1,200	
Broedermann Litzrodt	1,000	
Eggers & Heinlein	1,000	
Neuss, Hesslein & Co.	400	
G. Amsinck & Co.	200	
A. Rosenthal & Sons	3,000	
Core & Herbert	2,000	
J. S. Sembrada & Co.	1,500	10,300
MARCH 21.—By the *Pastores*=Port Limon:		
A. A. Linde & Co.	1,000	
Isaac Brandon & Bros.	1,000	
Stark & Co.	500	2,500
MARCH 21.—By the *Monterey*=Mexico:		
J. A. Medina & Co.	1,200	
American Trading Co.	1,000	
G. Amsinck & Co.	800	
Lawrence Johnson & Co.	200	3,200
MARCH 23.—By the *Allianca*=Colon:		
G. Amsinck & Co.	4,000	
A. M. Capen's Sons	2,200	
Pablo Calvet & Co.	8,500	
Mecke & Co.	4,000	
H. Wolff & Co.	3,400	
Pottberg, Ebeling & Co.	1,500	
Dumarest Bros.	1,300	
Gravenhorst & Co.	5,400	
W. R. Grace & Co.	700	
J. S. Sembrada & Co.	800	
Fidanque Bros & Sons	500	32,300
MARCH 24.—By the *Zacapa*=Cartagena:		
Andean Trading Co.	5,000	
Mecke & Co.	3,000	
Herman Wolff & Co.	1,500	
G. Amsinck & Co.	1,500	11,000
MARCH 28.—By the *Calamares*=Port Limon:		
Isaac Brandon & Bros.		1,500
MARCH 29.—By the *Colon*=Colon:		
Lawrence Johnson & Co.	19,000	
Pablo, Calvet & Co.	11,700	
G. Amsinck & Co.	3,400	
Otto Gerdan	1,100	
W. R. Grace & Co.	900	
Isaac Brandon & Bros.	2,000	
Piza, Nephews & Co.	2,500	
Muller, Schall & Co.	18,000	58,600
MARCH 30.—By the *Carrillo*=Cartagena:		
G. Amsinck & Co.	5,000	
Andean Trading Co.	8,000	
Herman Wolff & Co.	2,000	
Caballero & Blanco	300	15,300
APRIL 3.—By the *Esperanza*=Mexico:		
J. A. Medina & Co.	1,500	
G. Amsinck & Co.	500	
E. Steiger & Co.	200	
Various	7,500	9,700
APRIL 3.—By the *Siraola*=Cortez:		
G. Amsinck & Co.	500	
Rosenthal & Sons	2,000	
W. H. Knox & Co.	300	
Eggers & Heinlein	300	
E. H. Vivie	400	3,500
APRIL 4.—By the *Tenadores*=Port Limon:		
G. Amsinck & Co.	1,700	
Kunhardt & Co.	500	
A. A. Linde & Co.	1,000	
Isaac Brandon & Bros.	300	3,500
APRIL 6.—By the *Comus*=New Orleans:		
E. Steiger & Co.		60,000
APRIL 8.—By the *Concho*=Galveston:		
Various		*6,000
APRIL 8.—By the *Santa Marta*=Cartagena:		
H. Wolff & Co.	1,000	
B. Williamson	500	1,500

		POUNDS.
APRIL 10.—By the *Ancon*=Colon:		
G. Amsinck & Co.	40,000	
Muller, Schall & Co.	2,500	
A. M. Capen's Sons	4,600	
Mecke & Co.	6,400	
Pablo, Calvet & Co.	3,100	
J. S. Sembrada & Co.	2,100	
American Trading Co.	2,000	
H. Mann & Co.	800	
W. Loaiza & Co.	400	
De Sola Bros & Pardo	2,000	
Eggers & Heinlein	700	
W. R. Grace & Co.	1,500	
Isaac Brandon & Bros.	1,000	
Pottberg, Ebeling & Co.	1,900	
Lawrence Johnson & Co.	5,400	
Charles E. Griffin	1,000	75,400
APRIL 10.—By the *Creole*=New Orleans:		
E. Steiger & Co.		42,000
APRIL 11.—By the *Metapan*=Port Limon:		
Fruit Despatch Co.		2,000
APRIL 13.—By the *Panama*=Colon:		
De Sola Bros. & Pardo	1,000	
R. G. Barthold	2,500	
Fidanque Bros. & Sons	2,500	6,000
APRIL 14.—By the *Almirante*=Colombia:		
G. Amsinck & Co.	3,000	
Andean Trading Co.	4,000	
A. Held	2,500	
All American Mercantile Corp'n	1,500	
Various	300	11,300
APRIL 17.—By the *Monterey*=Mexico:		
G. Amsinck & Co.	2,000	
J. A. Medina & Co.	2,000	
H. Marquardt & Co.	2,000	
Thurston & Braidich	600	
E. Steiger & Co.	400	
General Export & Commission Co.	200	7,200
APRIL 17.—By the *Tuxtes*=Cortez:		
Rosenthal & Sons	3,500	
Gontard & Co.	1,500	
Eggers & Heinlein	1,500	6,500
APRIL 18.—By the *Saramacca*=Colombia:		
G. Amsinck & Co.	1,000	
Pottberg, Ebeling & Co.	2,000	
A. Held	5,000	8,000
APRIL 18.—By the *Pastores*=Port Limon:		
Isaac Brandon & Bros.	5,000	
Stark & Co.	3,000	
A. A. Linde & Co.	1,000	
Kunhardt & Co.	600	
Gontard & Co.	300	9,900
APRIL 18.—By the *Westmount*=Frontera:		
General Export & Commission Co.		5,000

AFRICANS.

MARCH 25.—By the *Quebra*=Liverpool:		
J. T. Johnstone & Co.		45,000
MARCH 27.—By the *Bacchus*=Lisbon:		
Edward Maurer Co., Inc.	135,000	
Rubber Trading Co.	15,000	150,000
MARCH 27.—By the *Kathlamba*=Singapore:		
Edward Maurer Co., Inc.		11,200
MARCH 28.—By the *Sama*=Lisbon:		
S. R. Sequerra		265,000
MARCH 30.—By the *Queen Margaret*=Liverpool:		
Robert Badenhop Co.	17,000	
Goodyear Tire & Rubber Co.	11,200	28,200
APRIL 3.—By the *Cloughton*=Liverpool:		
Robert Badenhop Co.		4,500
APRIL 4.—By the *Roma*=Lisbon:		
W. H. Stiles	112,000	
Robert Badenhop Co.	33,600	
Edward Maurer Co., Inc.	7,000	152,600
APRIL 6.—By the *St. George*=Liverpool:		
Arnold & Zeiss	33,600	
Robert Badenhop Co.	11,200	
Goodyear Tire & Rubber Co.	22,500	67,300
APRIL 10.—By the *Sargento Albuquerque*=Lisbon:		
Sequerra & Co.		45,000
APRIL 17.—By the *New York*=Liverpool:		
Meyer & Brown		22,500
APRIL 18.—By the *Boyne*=Liverpool:		
General Rubber Co.	56,200	
Goodyear Tire & Rubber Co.	45,000	
Robert Badenhop Co.	6,000	107,200
APRIL 19.—By the *Cannisaro*=Hull:		
Arnold & Zeiss		11,200
APRIL 19.—By the *Deli*=Batavia:		
Karl Schroeder	60,000	
Various	50,000	110,000

MANICOBA.

MARCH 27.—By the *Raphael*=Bahia:		
Adolph Hirsch & Co.		85,000
MARCH 27.—By the *Guajara*=Bahia:		
J. H. Rossbach Bros.	3,000	
Lawrence Johnson & Co.	2,000	5,000
APRIL 12.—By the *Rio Pardo*=Rio de Janeiro:		
G. Amsinck & Co.		22,500
APRIL 15.—By the *Minas Geraes*=Bahia:		
Lawrence Johnson & Co.		2,000
APRIL 19.—By the *Canova*=Bahia:		
Adolph Hirsch & Co.	105,000	
J. H. Rossbach Bros. & Co.	25,000	130,000

PLANTATION RUBBER.

MARCH 23.—By the *Manchuria*=London:		
Meyer & Brown	67,000	
General Rubber Co.	70,000	
L. Littlejohn & Co.	191,400	
Raw Products Co.	40,000	
Charles T. Wilson & Co., Inc.	100,000	
Alden's Successors, Ltd.	281,800	
Robert Badenhop Co.	2,000	
Goodyear Tire & Rubber Co.	22,500	
Edward Maurer Co., Inc.	72,000	
W. H. Stiles	11,200	857,900
MARCH 27.—By the *Kathlamba*=Singapore:		
Meyer & Brown	33,500	
Arnold & Zeiss	340,000	
Firestone Tire & Rubber Co.	67,000	
L. Littlejohn & Co.	453,100	
Charles T. Wilson Co., Inc.	60,000	
Edward Maurer Co., Inc.	140,000	
W. R. Grace & Co.	4,500	
J. T. Johnstone & Co.	11,000	
Henderson & Korn	150,000	
Goodyear Tire & Rubber Co.	78,000	
Hood Rubber Co.	120,000	
F. Stern & Co.	125,000	
Robinson & Co.	25,000	
Boston Insulated Wire & Cable Co.	4,500	
Fox & Co.	135,000	
Rubber Trading Co.	90,000	
W. H. Stiles	11,200	
Alden's Successors, Ltd.	13,440	
Various	553,660	2,414,900
MARCH 29.—By the *Minnehaha*=London:		
Meyer & Brown	115,000	
Alden's Successors, Ltd.	395,630	
Edward Maurer Co., Inc.	42,000	
Robert Badenhop Co.	50,000	
Charles T. Wilson Co., Inc.	40,000	
L. Littlejohn & Co.	29,386	672,016
MARCH 30.—By the *Queen Margaret*=Liverpool:		
The B. F. Goodrich Co.		4,500
MARCH 30.—By the *Ardgarroch*=London:		
The B. F. Goodrich Co.	180,000	
J. T. Johnstone & Co.	69,000	
Goodyear Tire & Rubber Co.	30,000	
Robinson & Co.	22,500	
Michelin Tire Co.	33,500	
Arnold & Zeiss	80,000	
Rubber Trading Co.	50,000	465,000
MARCH 31.—By the *Andania*=London:		
L. Littlejohn & Co.	35,534	
Meyer & Brown	80,000	
Edward Maurer Co., Inc.	30,000	
The B. F. Goodrich Co.	450,000	
Aldens' Successors, Ltd.	506,700	
Arnold & Zeiss	200,000	
J. T. Johnstone & Co.	147,000	
Raw Products Co.	22,500	
Robinson & Co.	13,500	
Michelin Tire Co.	35,000	
Goodyear Tire & Rubber Co.	11,200	1,531,434
APRIL 3.—By the *City of Naples*=Colombo:		
Meyer & Brown	40,000	
L. Littlejohn & Co.	109,350	
J. T. Johnstone & Co.	13,000	
Arnold & Zeiss	60,000	
Edward Maurer Co., Inc.	125,000	
W. H. Stiles	22,500	
Rubber Tire Trading Co.	68,000	437,850
APRIL 3.—By the *Kumeric*=Colombo:		
Meyer & Brown	191,500	
L. Littlejohn & Co.	187,410	
J. T. Johnstone & Co.	12,250	
Goodyear Tire & Rubber Co.	45,000	
W. R. Grace & Co.	3,500	
Arnold & Zeiss	75,000	
Edward Maurer Co., Inc.	40,000	
Various	145,340	700,000
APRIL 10.—By the *Mongolia*=London:		
General Rubber Co.	280,000	
Goodyear Tire & Rubber Co.	60,000	
Charles T. Wilson & Co., Inc.	190,000	
J. T. Johnstone & Co.	6,800	
L. Littlejohn & Co.	183,223	
Rubber Trading Co.	10,000	
Edward Maurer & Co., Inc.	33,500	
W. H. Stiles	22,500	
Various	129,223	915,246
APRIL 15.—By the *Korea*=London:		
Meyer & Brown	30,000	
General Rubber Co.	260,000	
Goodyear Tire & Rubber Co.	100,000	
Charles T. Wilson Co., Inc.	33,500	
Raw Products Co.	27,000	
L. Littlejohn & Co.	57,770	
Rubber Trading Co.	22,500	
Edward Maurer Co., Inc.	19,000	
Various	34,270	584,040
APRIL 17.—By the *Indra*=Singapore:		
Meyer & Brown	35,000	
Edward Maurer Co., Inc.	70,000	
Robinson & Co.	30,000	
Arnold & Zeiss	190,000	
Stern & Co.	25,000	
Fox & Co.	135,000	
Henderson & Korn	130,000	
Goodyear Tire & Rubber Co.	160,000	
Rubber Trading Co.	42,000	
Charles T. Wilson Co., Inc.	67,000	
Robert Badenhop Co.	25,000	
W. R. Grace & Co.	22,500	
H. R. Jefferds	15,000	
W. H. Stiles	33,600	
Aldens' Successors, Ltd.	13,400	
Hood Rubber Co.	7,000	
J. T. Johnstone & Co.	139,000	
L. Littlejohn & Co.	604,221	
Various	92,379	1,836,100
APRIL 18.—By the *Lapland*=Liverpool:		
J. T. Johnstone & Co.	2,500	
Goodyear Tire & Rubber Co.	2,500	5,000
APRIL 18.—By the *Boyne*=Liverpool:		
General Rubber Co.	11,200	
The B. F. Goodrich Co.	7,000	18,200
APRIL 19.—By the *Deli*=Batavia:		
L. Littlejohn & Co.	2,184	
Meyer & Brown	107,000	
G. Amsinck & Co.	50,000	
General Rubber Co.	370,000	
Aldens' Successors, Ltd.	218,200	
Manhattan Rubber Manufacturing Co.	20,000	
Goodyear Tire & Rubber Co.	30,000	
Edward Maurer Co., Inc.	270,000	
J. T. Johnstone & Co.	165,000	
Stein, Hirsch & Co.	9,000	
Rubber Trading Co.	33,500	
W. R. Grace & Co.	45,000	1,319,884
APRIL 20.—By the *Karama*=Colombo:		
Meyer & Brown	80,000	
L. Littlejohn & Co.	200,000	
J. T. Johnstone & Co.	80,000	
Arnold & Zeiss	30,000	
Edward Maurer Co., Inc.	45,000	435,000

CUSTOM HOUSE STATISTICS.

PORT OF HURON—FEBRUARY, 1916.

EXPORTS:	POUNDS.	VALUE.
Rubber scrap	780	$31
Reclaimed rubber	16,923	2,613
India rubber boots.....*pairs*	3,778	8,873
Automobile tires	.....	54
Other rubber tires	.....	397
Belting, hose, etc.	.....	1,052
All other manufactures of india rubber	.....	2,591
Totals	17,703	$15,611

PORT OF SAN FRANCISCO—FEBRUARY, 1916.

IMPORTS:		
India rubber	391,336	$209,449

PORT OF BOSTON—MARCH, 1916.

IMPORTS:		
India rubber	132,152	$100,388
Gutta percha	22,400	1,928
Gutta jelutong (Pontianak)	129,496	5,541
Totals	284,048	$107,857

PORT OF CHICAGO—MARCH, 1916.

IMPORTS:		
Rubber scrap	68,142	$4,862

PORT OF DETROIT—MARCH, 1916.

IMPORTS:		
Rubber scrap	50,632	$6,705
EXPORTS:		
Rubber scrap	133	$20
Reclaimed rubber	93,517	12,612

PORT OF GALVESTON—MARCH, 1916.

EXPORTS:		
Manufactures of india rubber	.....	$1

PORT OF HURON—MARCH, 1916.

IMPORTS:		
Rubber scrap	50,632	$6,705
EXPORTS:		
Reclaimed rubber	93,517	$12,612
India rubber boots.....*pairs*	2,552	6,016
Automobile tires	.....	31
Other rubber tires	.....	3,065
Belting, hose, etc.	.....	1,074
All other manufactures of india rubber	.....	3,417
Totals	93,517	$26,215

PORT OF NEW ORLEANS—MARCH, 1916.

IMPORTS:		
India rubber	906,894	$314,607

PORT OF SAN FRANCISCO—MARCH, 1916.

IMPORTS:		
India rubber	862,214	$520,918
Gutta jelutong (Pontianak)	26,930	1,305

PORT OF SEATTLE—MARCH, 1916.

IMPORTS:		
India rubber	1,616,789	$1,188,565
Gutta jelutong (Pontianik)	.....	1,241

IMPORTS AND EXPORTS OF RUBBER AND RUBBER MANUFACTURES AT THE PORT OF NEW YORK.

IMPORTS.

Week Ending—	India Rubber. Pounds.	India Rubber. Value.	Scrap for re-manufacture. Pounds.	Scrap for re-manufacture. Value.	Balata. Pounds.	Balata. Value.	Gutta Jelutong. Pounds.	Gutta Jelutong. Value.	Gutta Percha. Pounds.	Gutta Percha. Value.
March 24, 1916	*	$8,561	.....	.....	.....	.....	.....	.....	*	$193
	5,140,575	3,344,758	56,352	$8,927	60,760	$21,871	648,485	$51,061	40,096	9,222
March 31, 1916	*	8,150	.....	.....	.....	.....	.....	.....	*	24
	6,666,939	4,595,953	235,918	20,437	27,583	10,963	285,414	16,847	142,009	11,446
April 7, 1916	*	9,663	.....	.....	.....	.....	.....	.....	*	2,512
	7,177,900	4,534,546	250,452	24,018	36,371	15,568	.....	.....	4,320	832
April 14, 1916	*	121	.....	.....	.....	.....	.....	.....	.....	.....
	1,304,220	910,228	116,360	18,281	145,602	56,705	.....	.....	.....	.....

* Pounds not specified.

In addition to the above, 19,658 pounds of chicle was imported from Mexico, valued at $6,801, during the week of April 14, 1916.

EXPORTS.

FIGURES ISSUED FROM MARCH 27, 1916, TO APRIL 24, 1916.

EXPORTED TO—	Belting, Hose and Packing.	Footwear. Boots.	Footwear. Shoes.	Tires. Auto.	Tires. Other.	Insulated Wire and Cable.	Other Mnf. of India Rubber.	Fountain Pens.	Chewing Gum.	Reclaimed Rubber.	Scrap Rubber.
EUROPE:											
Denmark	$52	.....	$175	$229	.....	.....	$1,680	.....	.....	.....	.....
France	2,882	$232	1,084	10,501	.....	$31,630	45,309	$1,659	.....	$767	.....
Gibraltar	.....	.....	.....	.....	.....	.....	48	.....	.....	.....	.....
Greece	.....	.....	.....	.....	.....	.....	3	138	.....	.....	.....
Italy	886	.....	.....	80,294	$8,841	532	10,771	.....	.....	.....	.....
Netherlands	280	.....	.....	18,598	.....	11,230	6,295	.....	.....	.....	.....
Norway	.....	.....	.....	.....	.....	20,861	2,736	.....	.....	.....	.....
Portugal	.....	.....	.....	.....	.....	.....	60	992	.....	.....	.....
Russia in Europe	.....	.....	.....	30,200	.....	.....	.....	.....	.....	.....	.....
Spain	.....	7	.....	1,417	.....	14,349	1,082	333	.....	.....	.....
Sweden	52	.....	.....	.....	.....	.....	137	.....	.....	.....	.....
Switzerland	.....	.....	.....	.....	.....	506	29	.....	.....	.....	.....
United Kingdom—											
England	54,796	3,200	7,014	505,416	49.380	78,814	209,971	320	$18,350	12,325	$24,297
Scotland	.....	.....	.....	.....	.....	.....	3,642	358	.....	.....	2,796
Totals, Europe	$58,948	$3,439	$8,273	$646,655	$58,221	$157,922	$281,763	$3,800	$18,350	$13,092	$27,093
NORTH AMERICA:											
Bermuda	$95	.....	.....	$15	.....	$60	$144	$11	$4	.....	.....
British Honduras	2	.....	.....	7	.....	.....	25	2	.....	.....	.....
Canada	.....	.....	.....	.....	$3	228	219	.....	64	.....	.....
Central American States—											
Costa Rica	202	.....	.....	1,294	165	551	1,197	.....	213	.....	.....
Guatemala	162	.....	$65	332	.....	13	164	.....	.....	.....	.....
Honduras	315	.....	.....	287	.....	199	524	.....	.....	.....	.....
Nicaragua	848	.....	.....	.....	.....	.....	674	.....	.....	.....	.....
Panama	32,831	$176	.....	14,620	817	18,579	3,899	327	1,247	.....	.....
Salvador	454	.....	.....	1,472	.....	980	2,592	7	.....	.....	.....
Mexico	8,756	15	.....	14,120	2,611	1,736	3,035	.....	.....	.....	.....
Miquelon Island	.....	.....	.....	.....	.....	10	.....	.....	.....	.....	.....
Newfoundland and Labrador	8	2,318	2,211	1,561	.....	274	1,179	37	256	.....	.....
West Indies—											
British—											
Barbados	12	.....	.....	445	401	.....	382	.....	.....	.....	.....
Jamaica	348	.....	63	3,778	119	125	426	.....	26	.....	.....
Trinidad and Tobago	489	.....	.....	163	.....	.....	25	.....	.....	.....	.....
Other British	183	.....	3	1,686	224	7	303	11	1	.....	.....
Cuba	11,261	622	243	34,749	3,054	8,834	26,945	215	350	.....	.....
Danish	.....	.....	.....	.....	4	194	65	.....	7	.....	.....
Dutch	990	.....	.....	255	2	31	43	.....	13	.....	.....
French	4	.....	.....	50	.....	.....	3	.....	.....	.....	.....
Haiti	48	.....	1	.....	.....	954	138	288	.....	.....	.....
Santo Domingo	1,078	3	.....	2,041	10	1,880	1,215	20	6	.....	.....
Totals, North America	$58,086	$3,134	$2,586	$76,875	$7,410	$34,655	$43,197	$918	$2,187	.....	.....
SOUTH AMERICA:											
Argentina	$8,694	.....	.....	$46,133	$8,793	$1,970	$8,935	$1,064	$1,750	.....	.....
Bolivia	45	.....	.....	.....	.....	.....	24	.....	.....	.....	.....
Brazil	4,102	.....	$266	10,228	26,552	16,946	15,444	864	.....	.....	.....
Chile	1,386	.....	1,816	6,885	190	15,167	3,929	.....	.....	.....	.....
Colombia	4,469	.....	.....	2,219	1,799	1,227	2,612	1	21	.....	.....
Ecuador	1,330	.....	65	1,874	193	66	363	21	76	.....	.....
Guiana—British	18	.....	1,070	.....	.....	9	640	.....	1	.....	.....
Paraguay	.....	.....	.....	.....	.....	.....	32	.....	.....	.....	.....
Peru	1,474	.....	.....	1,189	.....	787	2,354	.....	.....	.....	.....
Uruguay	1,292	$47	2,083	2,931	2,078	1,390	1,992	.....	.....	.....	.....
Venezuela	165	.....	19	10,344	146	1,296	2,622	.....	.....	.....	.....
Totals, South America	$22,975	$47	$5,319	$81,803	$39,751	$38,858	$38,947	$1,950	$1,848	.....	.....
ASIA:											
Aden	.....	.....	.....	$24	.....	.....	.....	.....	.....	.....	.....
China	$494	$22	.....	933	$80	$1,691	$345	.....	.....	.....	.....
British East Indies—											
British India	574	.....	.....	6,521	42	312	4,419	$32	.....	.....	$1,344
Straits Settlements	.....	.....	.....	1,385	.....	.....	60	.....	.....	.....	.....
Dutch East Indies	517	.....	$32	12,290	.....	8,087	803	.....	.....	.....	.....
Japan	36	.....	.....	.....	.....	.....	1,111	.....	.....	$1,083	1,629
Russia in Asia	65	.....	.....	.....	.....	.....	38	1	.....	.....	.....
Totals, Asia	$1,686	$22	$32	$21,153	$122	$10,090	$6,776	$33	.....	$1,083	$9,749
OCEANIA:											
British—											
Australia and Tasmania	$996	$2,191	$1,065	$8,196	$10,778	$4.075	$8,155	.....	$344	.....	.....
New Zealand	6	1,134	230	5,522	676	.....	741	.....	.....	.....	.....
Philippine Islands	1,178	.....	.....	500	710	295	657	.....	.....	.....	.....
Totals, Oceania	$2,180	$3,325	$1,295	$14,218	$12,164	$4,370	$9,553	.....	$344	.....	.....
AFRICA:											
British Africa—											
South	$31,652	$705	.....	$8,326	.....	$445	$1,346	.....	$102	.....	.....
Canary Islands	.....	.....	.....	597	.....	.....	.....	.....	450	.....	.....
Egypt	.....	.....	.....	472	$927	.....	453	.....	2,428	.....	.....
Portuguese Africa	602	.....	.....	1,818	.....	.....	1,473	$354	133	.....	.....
Belgian Kongo	.....	.....	.....	17	15	.....	.....	.....	.....	.....	.....
Totals, Africa	$32,254	$705	.....	$11,230	$942	$445	$3,272	$354	$3,113	.....	.....

In addition to the above the following items were exported during the same period: To England—Balata, $26,996; to Panama—Balata, $90; to China—Vulcanized rubber, $1,600; to Cuba—Gutta percha, $297.

Plantation Rubber from the Far East

TOTAL EXPORTS FROM MALAYA.

(From January 1, 1916, to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	From Singapore. January 31, 1916.	From Malacca. January 31, 1916.	From Penang. January 31, 1916.	From Port Swettenham. February 29, 1916.	Total.
United Kingdom.*pounds*	2,154,533	408,800	2,057,067	5,270,234	9,890,634
The Continent	375,200	.....	.....	.....	375,200
Japan	311,067	.....	.....	.....	311,067
Ceylon	14,400	.....	64,933	396,846	476,179
United States	8,600,267	.....	591,733	.....	9,192,000
Australia	39,200	.....	.....	.....	39,200
Totals	11,494,667	408,800	2,713,733	5,667,080	20,284,280
For the same period, 1915	4,408,928	537,281	2,513,598	5,810,062	13,269,869
For the same period, 1914	2,771,704	.....	1,746,266	5,084,254	9,602,224
For the same period, 1913	2,020,289	.....	1,027,733	4,218,179	7,266,201

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to March 20, 1915 and 1916. Compiled by the Ceylon Chamber of Commerce.)

To—	1915.	1916.
United States.....*pounds*	1,745,084	6,514,304
Canada and Newfoundland	340,140	2,240
France	35,840	398,050
Russia	137,259	18,695
United Kingdom	7,404,194	4,498,779
Australia	43,486	198,280
Japan	119,582	45,396
Straits Settlements	78,990	.....
Totals	9,905,075	11,676,294

(Same period 1914, 8,123,655 pounds; same period 1913, 5,692,636.) The export figures of rubber, given in the above table for 1914, include the imports re-exported. (These amount to 928,613 pounds from the Straits Settlements and 246,546 pounds from India.) To arrive at the total quantity of Ceylon rubber exported for that year deduct these imports from the total exports. The figures for 1915 and 1916 are for Ceylon rubber only.

RUBBER AND GUTTA EXPORTS FROM JAVA AND MADURA.

		December.		Twelve Mos. Ending December 31.	
Plantation, to—		1914 Pounds.	1915. Pounds.	1914. Pounds.	1915. Pounds.
Holland	Ficus	1,773	.....	44,020	45,371
	Hevea	48,400	6,600	2,334,200	2,750,000
	Hevea (to order)	.....	.....	499,400	4,400
	Manihot (Ceara)	.....	.....	134,275	16,733
	Castilloa	7,150	.....	58,780	15,244
	Totals	57,323	6,600	3,070,675	2,831,688
Great Britain	Ficus	715	2,281	42,495	64,009
	Hevea	223,200	316,800	3,942,400	4,527,600
	Manihot (Ceara)	5,958	8,474	35,776	37,149
	Castilloa	6,543	19,006	34,456	103,506
	Totals	246,416	346,561	4,055,127	4,732,264
Belgium	Ficus	.....	.....	462	.....
	Hevea	.....	.....	547,800	.....
	Totals	.....	.....	548,262	.....
France	Hevea	.....	.....	6,600	11,000
United States	Ficus	1,934	.....	1,934	.....
	Hevea	264,000	792,000	426,800	7,339,200
	Manihot (Ceara)	.....	.....	.....	12,852
	Totals	265,934	792,000	428,734	7,352,052
Germany	Hevea	.....	.....	79,200	.....
	Castilloa	.....	.....	2,735	.....
	Totals	.....	.....	81,935	.....
Singapore	Ficus	2,578	847	5,665	21,113
	Hevea	24,200	253,000	226,600	992,200
	Manihot (Ceara)	.....	2,108	260	11,110
	Castilloa	.....	.....	1,811	.....
	Totals	26,778	255,955	234,336	1,024,423
Australia	Castilloa	.....	.....	.....	317
Japan	Hevea	.....	13,200	.....	257,400
Other countries	Ficus	1,943	5,863	2,191	8,065
	Hevea	.....	46,200	.....	187,000
	Manihot (Ceara)	.....	.....	.....	282
	Totals	1,943	52,063	2,191	195,347
	Grand totals	598,394	1,466,379	8,427,860	16,404,491
Gutta Percha, to—					
Singapore		88,216	21,384	1,382,955	678,269
Gutta Jelutong, to—					
Singapore		.....	.....	.....	1,584
Australia		.....	.....	24,200	.....
Totals		.....	.....	24,200	1,584

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram from Kuala Lumpur states that 4,429 tons of plantation rubber were exported in the month of March as against 5,207 tons in February and 3,418 tons in the corresponding month last year. Exports for the first quarter amounted to 14,107 tons, compared with 10,302 tons in 1915 and 7,324 tons in 1914. Appended are the comparative statistics:

	1914.	1915.	1916.
January.....*tons*	2,542	3,473	4,471
February	2,364	3,411	5,207
March	2,418	3,418	4,429
Totals	7,324	10,302	14,107

IMPORTS AND EXPORTS OF RUBBER AND GUTTA AT SINGAPORE.

IMPORTS.

January, 1916.

From—	Pará Rubber.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.
Federated Malay States—				
Port Swettenham.....*pounds*	1,683,266	.....	.....	.....
Malacca	1,360,266	.....	.....	.....
Teluk Anson	997,466	.....	.....	.....
Muar	949,733	.....	.....	.....
Kelantan	153,333	.....	.....	.....
Port Dickson	150,266	.....	.....	.....
Totals	5,294,330	.....	.....	.....
Sumatra—				
Bandjermassin	89,200	31,463	142,800	206,000
Asahan	40,000	.....	.....	.....
Indragiri	38,133	.....	.....	50,266
Belawan	12,533	.....	.....	.....
Palembang	3,733	1,066	10,000	530,400
Siak	1,200	.....	.....	.....
Totals	184,799	32,529	152,800	786,666
Borneo—				
Sarawak	135,733	.....	19,200	600,400
Sibu	29,066	3,466	17,290	448,533
Pontianak	71,533	9,066	9,733	70,933
Sambas	56,933	.....	4,666	27,731
Samarinda	3,333	7,400	1,866	.....
Totals	7,296,598	19,932	52,755	1,147,597
British North Borneo—				
Jesselton	104,000	.....	800	.....
Labuan	16,933	.....	666	82,166
Kudat	13,333	.....	.....	.....
Totals	134,266	.....	1,466	82,166
Java—				
Deli	1,113 800	.....	.....	.....
Batavia	118,666	.....	266	.....
Sourabaya	92,533	.....	.....	.....
Totals	1,324,999	.....	266	.....
Japan—				
Kobe	22,344	.....	.....	8,000
Yokohama	2,266	4,533	.....	2,666
Totals	24,610	4,533	.....	10,666
Siam—				
Patani	1,466	.....	.....	.....
Bangkok	.....	6,666	.....	.....
Totals	1,466	6,666	.....	.....
Straits Settlements—				
Penang	920,400	.....	.....	.....
Burma—				
Rangoon	3,600	.....	.....	.....
Djambi	142,133	.....	7,866	6,666
Other ports	800,933	4,400	15,200	372,400
Grand Totals	9,128,134	68,060	230,353	2,306,161

EXPORTS.

To—	Pará Rubber.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.
Europe:				
United Kingdom—				
England—				
London.....*pounds*	*2,050,400	.....	460,400	82,133
Liverpool	103,600	.....	.....	.....
Scotland (Glasgow)	.....	.....	11,066	.....
France (Marseilles)	64,933	.....	.....	56,400
Russia (Vladivostok)	515,600	.....	.....	.....
Totals	2,734,533	.....	471,466	138,533
North America:				
United States—				
New York	†3,998,536	8,800	112,000	598,533
Seattle	1,987,066	.....	.....	449,066
Akron	‡1,335,600	.....	.....	.....
San Francisco	276,000	.....	.....	26,933
Boston	8,933	.....	.....	126,000
Canada (Ontario)	33,600	.....	.....	.....
Totals	7,639,735	8,800	112,000	1,200,532
Grand Total	10,374,268	8,800	583,466	1,339,965

* 1,038,800 pounds transhipped.
† 208,400 pounds transhipped.
‡ 273,333 pounds transhipped.

STOCKS OF RUBBER.

	Stocks in United States.				Stock, Europe, Pará Grades.	Total Stocks, All Grades, Europe, Exclusive of Plantations.
	Pará.	East Indies Central America.	East Indies and Africa.	Total.		
Dec. 31, 1910..*tons*	160	*51	312	523	3,090	6,422
Dec. 31, 1911.....	319	*183	134	636	1,530	3,370
Dec. 31, 1912.....	201	*248	156	605	411	1,713
Dec. 31, 1913.....	97	*142	156	395	1,159	2,925
Dec. 31, 1914.....	94	*13	34	141	402	738
Dec. 31, 1915.....	273	22	45	340	269	481

*Including Caucho and Pernambuco.
Stock Pará Grades in Pará and afloat, 2,640 tons.

YEARLY EXPORTS AND IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

EXPORTS.

CRUDE RUBBER.

	1914		1915	
Sumatra (Belawan)—	Pounds.	Value.	Pounds.	Value.
To Holland	1,155,840	.....	1,892,000	.....
England	2,051,840	.....	7,183,680	.....
Belgium	11,200	.....	.....	.....
Germany	15,680	.....	.....	.....
Italy	.....	.....	22,400	.....
Penang	2,791,040	.....	790,720	.....
Singapore	1,621,760	.....	257,600	.....
United States	67,200	.....	4,071,560	.....
Totals	7,714,560	.....	14,148,960	.....
Great Britain—				
From Hull	.....	.....	.....	$191,165
Liverpool	.....	$1,761,562	.....	4,033,056
London	.....	29,874,387	.....	53,436,504
Totals (to U. S.)	.....	$31,635,949	.....	$57,660,725
Lisbon—				
To United States	.....	$581,036	.....	$1,585,727
Straits Settlements—				
To United States	.....	$5,747,040	.....	$25,043,863
France	14,589,120	$7,743,000	5,230,400	2,776,000
Bolivia	10,035,400	3,221,063	12,277,640	4,521,032
Malacca	.....	.....	24,687,916	.....

	1913		1914	
	Pounds.	Value.	Pounds.	Value.
Venezuela	.....	$203,363	.....	$126,679

RUBBER MANUFACTURES.

	1914		1915	
Great Britain—	Pounds.	Value.	Pounds.	Value.
From Birmingham	.....	$32,951	.....	$12,624
Leicester	.....	47,704	.....	31,969
Totals (to U. S.)	.....	$80,655	.....	$44,593
France—				
To Great Britain	.....	.....	.....	$4,283,000
Italy	.....	.....	.....	2,250,000
Spain	.....	.....	.....	935,000
Argentina	.....	.....	.....	312,000
Totals	.....	.....	.....	$7,780,000
France—Total Exports	13,621,440	$16,395,000	11,141,760	$13,959,000

BALATA.

	1913		1914	
	Pounds.	Value.	Pounds.	Value.
Venezuela	.....	$2,000,368	.....	$699,568

GUTTA JELUTONG.

	1914		1915	
Straits Settlements—	Pounds.	Value.	Pounds.	Value.
To United States	.....	$965,271	.....	$1,302,005

GUTTA PERCHA.

Straits Settlements—				
To United States	.....	$112,677	.....	$82,910

RECLAIMED.

Russia (Odessa)—				
To United States	.....	$104,281	.....	.....

SCRAP.

New Zealand (Wellington)—				
To United States	.....	$491	.....	$4,249

IMPORTS.

CRUDE RUBBER.

	1914		1915	
Ceylon—	Pounds.	Value.	Pounds.	Value.
From Straits Settlements	2,931,953	.....	2,527,347	.....
India	853,534	.....	1,164,293	.....
Burma and other countries	11,624	.....	10,663	.....
Totals	3,797,111	.....	3,702,303	.....
France—				
From United States	.....	.....	.....	$474,000
Great Britain	.....	.....	.....	10,352,000
Spain	.....	.....	.....	9,000
Totals	.....	.....	.....	$10,835,000
France	25,907,840	$13,751,000	29,787,520	$15,810,000
United Kingdom	.....	77,106,908	.....	98,898,862

	1913		1914	
Russia (Odessa)—	Pounds.	Value.	Pounds.	Value.
From United States	2,000	$452	78,000	$12,127

RUBBER MANUFACTURES.

	1914		1915	
France—	Pounds.	Value.	Pounds.	Value.
From United States	.....	.....	.....	$1,323,000
Great Britain	.....	.....	.....	3,021,000
Totals	.....	.....	.....	$4,344,000
France	.....	$4,970,000	.....	$4,928,000
New Zealand	.....	233,305	.....	241,334

CHICLE.

United States—				
From Mexico	.....	.....	2,197,000	.....
*Canada	.....	.....	2,181,000	.....
British Honduras	.....	.....	1,139,000	.....
Venezuela	.....	.....	952,000	.....
Cent. Am. States	.....	.....	26,000	.....
Other countries	.....	.....	5,000	.....
Totals	.....	.....	6,500,000	.....

SCRAP.

United States	19,118,966	$1,356,750	12,342,117	$877,026

*Chicle is not produced in Canada, but large quantities from other British possessions are imported and handled through the Dominion.

EXPORTS OF INDIA RUBBER FROM MANAOS DURING FEBRUARY, 1916.

EXPORTERS.	NEW YORK. Fine.	Medium.	Coarse.	Caucho.	Totals.	EUROPE. Fine.	Medium.	Coarse.	Caucho.	Totals.	Grand Totals.
Suter & Co.....*kilos*	70,031	6,795	25,665	58,444	160,935	15,300	1,760	.....	36,160	53,220	214,155
Pralow & Co.	127,864	23,845	69,412	75,335	296,456	66,138	6,792	31,387	50,897	155,214	451,670
Armazens Andresen	140,318	18,771	47,604	26,930	233,623	.....	.....	.....	.....	.....	233,623
General Rubber Co. of Brazil	34,222	8,157	16,712	26,693	85,784	22,553	4,840	912	16,791	45,096	130,880
I. G. Araujo	94,042	8,297	1,204	.....	103,543	14,720	1,920	2,330	150	19,120	122,663
Tancredo Porto & Co.	29,776	7,638	9,895	10,112	57,421	12,226	4,536	7,462	333	24,557	81,978
Sinfronio & Co.	22,424	3,958	8,621	766	35,769	5,140	2,827	3,065	118	11,150	46,919
Motta & Co.	.....	.....	.....	.....	.....	14,220	1,910	4,724	3,190	24,044	24,044
B. Levy & Co.	11,079	2,363	1,136	.....	14,578	.....	.....	.....	.....	.....	14,578
Lima & Irmaos	.....	.....	.....	.....	.....	8,352	2,400	3,430	117	14,299	14,299
Semper & Co.	8,699	1,312	2,401	.....	12,412	1,600	.....	.....	.....	1,600	14,012
Bezerra & Co.	.....	.....	.....	.....	.....	3,459	765	2,379	3,670	10,273	10,273
Moraes, Carneiro & Co.	2,720	720	3,337	1,210	7,987	.....	.....	.....	.....	.....	7,987
Amorim Irmaos	800	320	3,000	3,750	7,870	.....	.....	.....	.....	.....	7,870
Stowell & Sons	.....	.....	685	.....	685	532	69	45	6,363	7,009	7,694
Sundries	4,028	563	1,865	2,179	8,635	160	.....	610	1,440	2,210	10,845
Totals: February, 1916.	546,003	82,739	191,537	205,419	1,025,698	164,400	27,819	56,344	119,229	367,792	1,393,490
January, 1916	561,143	110,411	176,779	148,142	596,475	543,822	58,574	75,105	123,703	801,204	1,797,679

(Compiled by Suter & Co., Manáos.)

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF RUBBER AND RUBBER MANUFACTURES.

ARTICLES.	January, 1916. Pounds.	January, 1916. Value.	Seven Months Ending January, 1916. Pounds.	Seven Months Ending January, 1916. Value.
UNMANUFACTURED—(*free*):				
Balata	261,764	$96,437	1,555,171	$592,907
Guayule gum	125,557	34,140	1,604,789	528,493
Gutta jelutong	1,896,402	81,108	15,030,340	644,155
Gutta percha	164,473	16,831	1,420,914	154,789
Totals	2,448,196	$228,516	19,611,214	$1,920,344
India rubber:				
From France			156,864	$75,223
Portugal	114,945	$62,014	1,708,011	623,400
United Kingdom	5,084,899	3,724,017	42,186,534	24,960,492
Central America and British Honduras	124,575	59,550	677,485	300,159
Mexico	25,074	11,060	1,290,338	459,568
Brazil	4,714,898	2,422,751	28,900,347	11,690,080
Other South America	766,108	367,331	3,889,279	1,694,303
East Indies	10,328,712	5,554,544	58,574,655	31,119,327
Other countries	173,935	110,000	406,051	246 276
Totals	21,333,146	$12,311,267	137,789,564	$71,168,828
Rubber scrap	1,614,325	$132,824	9,513,547	$713,277
Totals, unmanufactured	25,395,667	$12,672,607	166,924,325	$73,802,459
Chicle (*dutiable*)	386,176	$164,244	3,969,707	$1,419,842
MANUFACTURED—(*dutiable*):				
Gutta percha		$1,008		$5,781
India rubber		19,141		172,656
Totals, manufactured		$20,149		$178,437
Substitutes—elasticon, etc.		$2,276		$11,363

EXPORTS OF DOMESTIC MERCHANDISE.

MANUFACTURED—	January, 1916. Pounds.	January, 1916. Value.	Seven Months Ending January, 1916. Pounds.	Seven Months Ending January, 1916. Value.
Scrap and old rubber	479,984	$46,509	2,269,725	$224,209
Reclaimed rubber	895,112	110,001	3,897,202	513,902
Belting, hose and packing		290,304		1,465,511
Rubber boots (*pairs*)	115,111	264,253	554,883	1,245,094
Rubber shoes (*pairs*)	85,680	48,818	1,131,406	598,753
Automobile tires:				
To England		623,366		5,465,447
Canada		68,752		736,894
Mexico		33,825		128,979
Cuba		35,574		268,638
Australia		419,791		796,888
Philippine Islands		25,595		167,580
Other countries		539,428		2,190,826
Totals		$1,746,331		$9,755,252
All other tires		$174,939		$1,784,608
Fountain pens (*number*)	15,636	11,940	89,245	86,263
Other rubber manufactures		494,755		3,428,436
Totals, manufactured		$3,187,850		$19,102,028

EXPORTS OF FOREIGN MERCHANDISE.

UNMANUFACTURED—	January, 1916. Pounds.	January, 1916. Value.	Seven Months Ending January, 1916. Pounds.	Seven Months Ending January, 1916. Value.
Balata	7,947	$2,982	196,087	$78,386
Guayule gum			18,500	7,770
Gutta jelutong			2,773	305
Gutta percha			57,640	9,351
India rubber	607,509	411,612	2,469,269	1,347,892
Scrap and refuse			9,204	734
Totals, unmanufactured	610,456	$414,594	2,753,473	$1,444,438
Chicle	24,774	$6,301	98,906	$28,341
MANUFACTURED—				
Gutta percha				$185
India rubber		$560		7,595
Totals, manufactured		$560		$7,780

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

	January, 1916. Pounds.	January, 1916. Value.	January, 1916. Seven Months Ending Pounds.	January, 1916. Seven Months Ending Value.
To Alaska:				
Belting, hose and packing		$4,745		$71,393
Boots and shoes (*pairs*)	2,961	5,457	39,940	102,053
All other goods		1,466		19,458
Totals		$11,668		$192,904
To Hawaii:				
Belting, hose and packing		$6,708		$53,769
Automobile tires		71,021		311,192
Other tires		7,025		36,333
Other rubber goods		7,362		51,336
Totals		$92,116		$452,630
To Philippine Islands:				
Belting, hose and packing		$4,361		$23,088
Boots and shoes (*pairs*)			$16,706	14,690
Tires		19,340		189,749
Other rubber goods		33,187		105,928
Totals		$56,888		$333,455
To Porto Rico:				
Belting, hose and packing		$2,191		$25,742
Automobile tires		30,946		213,789
Other tires		1,285		13,695
Other rubber goods		5,510		38,545
Totals		$39,932		$291,771

UNITED STATES IMPORTS OF RUBBER AND RUBBER MANUFACTURES FOR QUARTER ENDING SEPTEMBER 30, 1915.

	July 1 to Sept. 30, 1915. Pounds.	July 1 to Sept. 30, 1915. Value.
India rubber, gutta percha, etc. Unmanufactured—(*free*):		
Balata, crude	571,291	$227,864
Guayule gum	1,378,854	396,406
Gutta jelutong	7,777,902	337,305
Gutta percha, crude	720,821	80,438
Crude india rubber	55,393,384	27,730,562
Scrap rubber	3,787,779	225,290
Reclaimed rubber	576,497	91,301
Totals	70,206,528	$29,089,166
Manufactured—(*dutiable*):		
Gutta percha, 10 per cent		$3,272
India rubber, 10 per cent		115,829
Druggists' sundries of rubber, 15 per cent		5,464
Hard rubber, 25 per cent		7,952
Rubber sponges, 15 per cent		1,837
Substitutes, elasticon, etc., 15 per cent		2,867
Totals		$137,221
Chicle: Crude	952,018	$336,522
Refined	544,441	285,762
Totals	1,496,459	$622,284

RUBBER STATISTICS FOR CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—(*free*):	January, 1916. Pounds.	January, 1916. Value.	Ten Months Ending January, 1916. Pounds.	Ten Months Ending January, 1916. Value.
Rubber and gutta percha, crude caoutchouc or india rubber.				
From Great Britain	353,296	$236,863	4,046,261	$2,223,638
United States	619,556	395,764	3,618,324	1,907,407
Brit. Straits Settlements			22,574	11,659
Other countries	35,267	12,739	232,045	106,318
Totals	1,008,119	$645,366	7,919,204	$4,249,022
Rubber, re-covered:				
From Great Britain			4,392	$2,482
United States	553,934	$78,679	3,925,905	504,684
Totals	553,934	$78,679	3,930,297	$507,166
Hard rubber, in sheets and rods:				
From Great Britain	58	$64	2,302	$1,404
United States	28,343	3,264	154,946	17,731
Totals	28,401	$3,328	157,248	$19,135
Rubber substitute:				
From Great Britain			16,644	$1,812
United States	61,894	$4,060	451,670	35,194
Totals	61,894	$4,060	468,314	$37,006
Rubber, powdered, and rubber or gutta percha waste:				
From Great Britain			7,314	$579
United States	146,678	$7,516	1,007,382	60,904
Other countries	3,120	96	15,514	630
Totals	149,798	$7,612	1,030,210	$62,113
Rubber thread, not covered:				
From United States	2,423	$3,388	25,739	$35,300
Balata, crude:				
From United States			1,644	$991
Chicle, crude:				
From Great Britain			2,888	$1,675
United States	11,180	$3,354	242,151	92,911
British Honduras	132,529	50,245	965,526	356,818
Mexico	89,449	33,133	305,929	113,023
Totals	233,158	$86,732	1,516,494	$564,427

MANUFACTURED—(*dutiable*):	January, 1916. General Tariff. Value.	January, 1916. Preferential Tariff. Value.	Ten Months Ending January, 1916. General Tariff. Value.	Ten Months Ending January, 1916. Preferential Tariff. Value.
Waterproof clothing:				
From Great Britain		$8,089	$3,454	$282,974
United States	$9,854		89,952	
Other countries			63	
Totals	$9,854	$8,089	$93,469	$282,974

MANUFACTURED—(*dutiable*):	January, 1916. General Tariff. Value.	January, 1916. Preferential Tariff. Value.	Ten Months Ending January, 1916. General Tariff. Value.	Ten Months Ending January, 1916. Preferential Tariff. Value.
Hose, lined with rubber:				
From Great Britain	.....	$109	.....	$529
United States	$7,062	.....	$61,136	.....
Totals	$7,062	$109	$61,136	$529
Mats and matting:				
From Great Britain	.....	.....	.....	$121
United States	$1,194	.....	$2,207	.....
Totals	$1,194	.....	$2,207	$121
Packing:				
From Great Britain	$91	$46	$201	$1,199
United States	4,734	.....	41,527	.....
Totals	$4,825	$46	$41,728	$1,199
Tires of rubber for all vehicles:				
From Great Britain	.....	$975	$14,102	$22,882
United States	$83,479	.....	1,123,162	.....
France	.....	.....	16,437	.....
Other countries	685	.....	1,817	.....
Totals	$84,164	$975	$1,155,518	$22,882
*Rubber cement and all manufactures of india rubber and gutta percha, N. O. P.:				
From Great Britain	$31	$12,867	$2,416	$132,953
United States	49,095	.....	474,142	.....
Other countries	.....	.....	688	.....
Totals	$49,126	$12,867	$477,246	$132,953
Hard rubber in tubes:				
From United States	$283	.....	$3,196	.....
Boots and shoes:				
From Great Britain	.....	.....	.....	$11,546
United States	$5,755	.....	$73,168	.....
Other countries	.....	.....	10	.....
Totals	$5,755	.....	$73,178	$11,546
Belting:				
From Great Britain	.....	$119	.....	$1,172
United States	$3,835	.....	$42,962	.....
Totals	$3,835	$119	$42,962	$1,172
Webbing—over one inch wide:				
From Great Britain	$11	$894	$78	$11,505
United States	20,320	.....	138,309	.....
Other countries	.....	.....	330	.....
Totals	$20,331	$894	$138,717	$11,505

*In addition the imports of rubber cement and all manufactures of india rubber and gutta percha not otherwise provided for amounted to $251 from various countries for January; and $207 from Great Britain and $2,046 from various countries for the ten months ending January, 1916, the values being at treaty rates.

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

MANUFACTURED, DUTIABLE—	January, 1916. Product of Canada. Value.	January, 1916. Re-exports of foreign goods. Value.	Ten Months Ending January, 1916. Product of Canada. Value.	Ten Months Ending January, 1916. Re-exports of foreign goods. Value.
Belting:				
To Great Britain	.....	.....	$150	.....
United States	.....	.....	424	$58
Newfoundland	$888	.....	1,000	.....
Other countries	.....	.....	33	.....
Totals	$888	.....	$1,607	$58
Hose:				
To Great Britain	$3,017	.....	$14,625	.....
United States	40	.....	3,976	$201
Newfoundland	267	.....	3,233	.....
Other countries	9,404	.....	11,304	.....
Totals	$12,728	.....	$33,138	$201
Boots and shoes:				
To Great Britain	$162,981	.....	$580,289	.....
United States	.....	.....	3,531	$492
Newfoundland	2,843	.....	72,602	.....
Australia	2,457	.....	26,774	.....
Other countries	4,041	.....	23,235	327
Totals	$172,322	.....	$706,431	$819
Mats and matting:				
To Great Britain	$1,254	.....	$1,254	.....
Other countries	31	.....	464	.....
Totals	$1,285	.....	$1,718	.....
Clothing:				
To Great Britain	.....	.....	$27	$10
United States	.....	.....	39	202
Newfoundland	.....	.....	140	.....
Other countries	.....	.....	62	.....
Totals	.....	.....	$268	$212
*Rubber waste:				
To Great Britain	$6,368	.....	$6,368	.....
United States	62,195	.....	475,089	$1,964
Totals	$68,563	.....	$481,457	$1,964
All other mnf., N. O. P.:				
To Great Britain	$109,824	$30	$749,508	$3,701
United States	4,352	4,896	100,154	280,014
Newfoundland	154	.....	4,951	785
Australia	.....	.....	4,576	.....
Other countries	20,071	.....	97,345	10
Totals	$134,401	$4,926	$956,534	$284,510
†Gum chicle:				
To Great Britain	.....	.....	$10,000	.....
United States	$120,048	$1,000	640,251	$112,840
Other countries	.....	.....	42,216	1,107
Totals	$120,048	$1,000	$692,467	$113,947

*During January, 60,600 pounds of rubber waste was exported to Great Britain, being the total amount shipped for the ten months ending January, 1916; also 862,100 pounds was exported to the United States during the month of January, making a total of 7,490,200 pounds for the ten months ending January, 1916.

†During January, 201,595 pounds of gum chicle was exported to the United States. During the ten months ending January, 1916, 20,000 pounds was exported to Great Britain, 1,169,763 pounds to the United States, and 64,620 pounds to various countries.

UNITED KINGDOM RUBBER STATISTICS FOR MONTH ENDING MARCH 31, 1916.

IMPORTS.

UNMANUFACTURED—	March, 1916. Pounds.	March, 1916. Value.	Three Months Ending March, 1916. Pounds.	Three Months Ending March, 1916. Value.
Crude rubber:				
From Dutch East Indies	475,800	$384,834	1,490,400	$1,143,767
French West Africa	447,900	227,181	634,900	325,513
Gold Coast	152,400	49,737	331,200	121,544
Other countries in Africa	955,700	547,008	2,338,500	1,256,126
Peru	35,500	23,722	589,800	417,683
Brazil	2,518,300	1,691,280	6,694,500	4,800,256
British India	392,800	285,637	1,045,300	807,241
Straits Settlements and dependencies, including Labuan	6,188,400	4,763,918	14,513,600	11,122,115
Federated Malay States	2,164,200	1,428,019	6,395,400	4,717,529
Ceylon and dependencies	2,702,000	2,082,588	6,717,200	5,238,803
Other countries	253,000	167,272	602,400	424,167
Totals	16,286,000	$11,647,196	41,353,200	$30,374,744
Waste and reclaimed rubber	697,600	$58,485	1,907,500	$197,000
Gutta percha	863,000	365,827	2,187,000	1,006,482
MANUFACTURED—				
Apparel, waterproofed	.....	$8,573	.....	$17,510
Boots and shoes—*dozen pairs*	17,220	197,957	60,506	510,771
Insulated wire	.....	106,558	.....	145,533
Submarine cables	.....	.....	.....	30,292
Automobile tires and tubes	.....	1,215,782	.....	3,729,136
Motorcycle tires and tubes	.....	25,039	.....	90,566
Cycle tires and tubes	.....	31,381	.....	139,740
Tires not specified	.....	2,449	.....	14,755

EXPORTS.

MANUFACTURED—	March, 1916. Pounds.	March, 1916. Value.	Three Months Ending March, 1916. Pounds.	Three Months Ending March, 1916. Value.
Apparel, waterproofed:				
To France	.....	$26,550	.....	$91,868
British South Africa	.....	15,974	.....	36,882
British East Indies	.....	10,760	.....	17,374
Australia	.....	28,557	.....	83,567
New Zealand	.....	22,421	.....	67,998
Canada	.....	20,286	.....	44,620
Other countries	.....	88,087	.....	220,138
Totals	.....	$212,635	.....	$562,447
Boots and shoes—*dozen pairs*	7,074	$36,076	21,720	$111,965
Insulated wire	.....	199,134	.....	541,992
Submarine cables	.....	208,377	.....	333,736
Automobile tires and tubes	.....	366,565	.....	1,129,196
Motorcycle tires and tubes	.....	34,870	.....	95,487
Cycle tires and tubes	.....	219,448	.....	712,291
Tires not specified	.....	67,408	.....	202,278
Manufactures not specified	.....	619,699	.....	1,679,563

EXPORTS—FOREIGN AND COLONIAL.

UNMANUFACTURED—	March, 1916. Pounds.	March, 1916. Value.	Three Months Ending March, 1916. Pounds.	Three Months Ending March, 1916. Value.
Crude rubber:				
To Russia	1,397,800	$987,599	2,929,900	$1,935,754
France	1,676,400	1,277,036	5,109,600	3,978,355
United States	4,544,700	3,522,193	15,084,800	11,230,231
Other countries	1,815,500	1,345,350	4,828,800	3,382,696
Totals	9,434,400	$7,132,178	27,953,100	$20,527,036
Waste and reclaimed rubber	104,900	$17,729	163,500	$27,634
Gutta percha	40,900	10,959	160,100	83,942
MANUFACTURED—				
Apparel, waterproofed	.....	$253	.....	$355
Boots and shoes—*dozen pairs*	3,730	21,141	10,572	61,267
Insulated wire	.....	9,477	.....	25,870
Automobile tires and tubes	.....	338,620	.....	1,016,182
Motorcycle tires and tubes	.....	592	.....	7,663
Cycle tires and tubes	.....	3,164	.....	58,315
Tires not specified	.....	1,963	.....	2,940

THE RUBBER SCRAP MARKET.

NEW YORK.

THE break in the shoe market that had been confidently predicted, occurred during the first week in April, and boots and shoes declined to 9@9½ cents. Auto tires, while not so badly affected as boots and shoes, were influenced by the downward movement, and mixed tires sold to the mills for 6½ cents delivered. G. & G. tires brought 8¼ to 8⅜ cents. The other tire sorts failed to be of interest even at easier prices, while No. 1 inner tubes at 29 cents were neglected through anticipation of lower prices. The mechanical grades all exhibited easy tendencies due to the small demand occasioned by general tone of the market. This general weakness and subsequent decline of prices in all grades is due to the similar condition of crude rubber that is always a prime factor in scrap conditions.

Spring collections are very much heavier this year, a circumstance to be expected when the enormous consumption of rubber is considered. These large accumulations of scrap naturally have a depressing influence on price values.

On April 22 sales of shoes were made at 8⅛ cents delivered, although some mills frankly held out for 8¼ cents. The actual amount of business doing was not large, according to reliable reports, and this view is substantiated by the prevailing quietness. The tire situation is still weaker as the month draws to a close, and mixed auto tires were quoted at 6¼ cents delivered, though actual sales could not be consummated at more than 6⅛ cents. Some G. & G. tires were going at 8¼ cents, but a shade better was offered by the mills. Inner tubes were easier with No. 1 grades, selling at 28 cents delivered. Mechanical grades were weak, particularly hose, the garden variety bringing $1.40 delivered to the mill. Air brake hose appeared to be in good demand, but prices were lower than a fortnight ago.

NEW YORK QUOTATIONS FOR CARLOAD LOTS DELIVERED.

APRIL 28, 1916.

Prices subject to change without notice.

	Per Pound.
Boots and shoes	$0.08¾@ 0.09
Trimmed arctics	.06⅞@ .07
White tires, Goodrich and Goodyear	.08½@ .08⅝
Auto tires, standard white	.06¼@ .0635
standard mixed	.06¼@ .0635
stripped, unguaranteed	.04⅜@ .04½
Auto peelings, No. 1	.09½@ .10
No. 2	.08½@ .09
Inner tubes, No. 1	.28½@ .29
No. 2	.12½@ .13
red	.12¾@ .13
Irony tires	.02 @ .02½
Bicycle tires	.04½@ .04⅝
Solid tires	.05⅛@ .05½
White scrap, No. 1	.14 @ .15½
No. 2	.10 @ .11
Red scrap, No. 1	.10½@ .11¼
No. 2	.08 @ .09
Mixed black scrap, No. 1	.04¼@ .04½
No. 2	.03⅞@ .04
Rubber car springs	.04½@ .05
Horse shoe pads	.04¼@ .04½
Matting and packings	.01 @ .01¼
Garden hose	.01¾@ .01⅞
Air brake hose	.05⅞@ .06⅛
Cotton fire hose	.02½@ .02¾
Large hose	.01⅞@ .02
Hard rubber scrap, No. 1, bright fracture	.25 @ .26
Battery jars (black compound)	.03 @
Insulated wire stripping	.03½@ .03⅝
Rubber heels	.03¼@ .03½

MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

EGYPTIAN COTTON.

THE Alexandria market developed weakness about the middle of March and prices steadily declined, showing a loss of about ½ cent on the old crop cotton. This reaction is apparently of local origin, as the American markets were generally well sustained. Prices for new crop futures have been averaging about 2 cents less than those for the old crop for some time. The statistical local position continues to grow stronger daily, stocks are decreasing, and the interior is now practically cleared of cotton. It must not be forgotten that before getting new cotton, five months' requirements are to be filled, and the present stocks at Alexandria are insignificant.

SEA ISLAND COTTON.

The southern markets have been quiet for the past month, and prices show very little change as compared to the figures of a month ago. The entire crop has been disposed of, and is now in second hands, consequently the southern markets are closed until the next crop comes in. On April 21 there were 67,903 bales in sight at all ports, compared to 63,754 at the same date last year.

FABRICS.

Great Britain's cotton fabric embargo, that went into effect last month, was the result of England's desire to facilitate the shipment of war orders. Permits must be obtained from the British Consul for all shipments of cotton fabrics, and those classed as necessities are given preference over all others. This new order went into effect without disturbing the market.

Tire fabrics are still high, and deliveries on contracts are usually delayed. Supplies are used up so rapidly that the rubber mills are unable to maintain any stocks of tire fabric, whatever. There has been no change in the market during the month, and prices are firm.

COTTON DUCK.

Trade conditions are prosperous and the demand is good for hose and mechanical duck, in fact, deliveries are only restricted by the question of securing raw materials promptly. Goods are going into consumption as soon as they are shipped. Auto top manufacturers are buying for 1917 deliveries.

Most of the ducks, drills, sheeting, etc., used by the rubber trade are sold up to the end of the year. Indeed, many contracts have already been written, covering the first six months of 1917 and options are called for on deliveries, during the last half of the coming year. The demand seems to be increasing, and prices have advanced in a firm market. There is little doubt that the recent advance in wages paid the textile workers in New England will become general throughout the East. American textile workers will then enjoy the distinction of being the highest paid labor in the textile world. That the direct cause of this increase is entirely due to the high wages paid by manufacturers of munitions, there is no doubt, and it is equally true that when normal conditions once more prevail, wages will be revised.

NEW YORK QUOTATIONS.

APRIL 28, 1916.

Prices subject to change without notice.

Aeroplane and Balloon Fabrics:			
Wamsutta, S. A. I. L. No. 1, 40-inch	*yard*	$0.22 @	
No. 4, 38½-inch		.22 @	
O/X B. 36-inch		.12¾@	
Wool Stockinettes—52-inch:			
A—14-ounce	*yard*	1.12½@	
B—14-ounce		1.25 @	
C—14-ounce		1.50 @	
Cotton Stockinettes—52-inch:			
D—14-ounce	*yard*	.49 @	.50
E—11½-ounce		.39 @	.40
F—14-ounce		.53 @	.54
G— 8-ounce		.43 @	.44
H—11-ounce		.48 @	.49
I — 9-ounce		.40½@	.41½
Colors—white, black, blue, brown.			
Tire Fabrics:			
17¼-ounce Sea Island, combed	*square yard*	.75 @	.78
17¼-ounce Egyptian, combed		.70 @	
17¼-ounce Egyptian, carded		.67 @	
17¼-ounce Peelers, carded		.46 @	
Sheeting:			
40-inch 2.35-yard	*yard*	.10½@	
40-inch 2.50-yard		.10 @	
40-inch 2.70-yard		.09¼@	
40-inch 2.85-yard		.08¾@	
40-inch 3.15-yard		.08½@	
Osnaburgs:			
40-inch 2.25-yard	*yard*	.11¾@	
40-inch 2.48-yard		.10½@	
37½-in. 2.42-yard		.10¾@	
Mechanical Ducks:			
Hose	*pound*	.27½@	.28½
Belting		.27½@	.28½
Carriage Cloth Duck:			
38-inch 2.00-yard enameling duck	*yard*	.13½@	
38-inch 1.74-yard		.15½@	
72-inch 16.66-ounce		.33 @	
72-inch 17.21-ounce		.34 @	
Drills:			
38-inch 2.00-yard	*yard*	.13½@	
40-inch 2.47-yard		.11 @	
52-inch 1.90-yard		.14¾@	
52-inch 1.95-yard		.14½@	
60-inch 1.52-yard		.19¾@	

Yarns:				
Garden Hose, 12/2 cabled	pound	$0.28	@	.30
Fire Hose 12/1		.27	@	.29
Imported Woolen Fabrics Specially Prepared for Rubberizing—Plain and Fancies:				
63-inch, 3¼ to 7½ ounces	square yard	.38	@	1.55
36-inch, 2¾ to 5 ounces		.35	@	.85
Imported Plaid Lining (Union and Cotton):				
63-inch, 2 to 4 ounces	square yard	.35	@	.75
36-inch, 2 to 4 ounces		.20	@	.45
Domestic Worsted Fabrics:				
36-inch, 4½ to 8 ounces	square yard	.25	@	.45
Domestic Woven Plain Linings (Cotton):				
36-inch, 3¾ to 5 ounces	square yard	.15½	@	.20
Raincoat Cloth (Cotton):				
Bombazine	yard	.06	@	.08
Twills		.10	@	.15
Tweed		.20	@	.35
Tweed, printed		.06	@	.15
Plaid		.06	@	.09
Repp		.18½	@	.25
Burlaps:				
32—7½-ounce	100 yards		none	
40—7½-ounce		7.50	@	
40—8-ounce		7.60	@	
40—10-ounce		10.00	@	
40—10½-ounce		10.15	@	
45—7½-ounce		8.85	@	
45—8-ounce		9.00	@	
48—10-ounce		14.75	@	

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

PRICE changes during the month have not been important and most materials have been held at previously quoted levels. This is true of litharge, white lead, orange mineral, zinc oxide, lampblack, china clay, lithopone and whiting. High prices and scarcity of some materials have contributed to retard jobbing activity.

Barytes has sold at advanced prices and the market is strengthened not only by good consuming demand, but also by increased cost of production.

The movement of prices for spirits of turpentine was downward during the last week of the month. There has been no apparent realization of the expected spring inquiry so far, and primary values are said to have settled to a lower than cost basis.

In the case of caustic soda the undertone of the spot market continues heavy, on account of the amount of resale stock held by second hands. The inability to secure ocean tonnage has resulted in moderate accumulations, and sellers are experiencing some difficulty in moving goods into consuming channels.

NEW YORK QUOTATIONS, APRIL 28, 1916.

(Subject to change without notice.)

Acetone (drums)	lb.	$0.40	@	
Acid, acetic, 28 per cent. (bbls.)	lb.	.07½	@	$0.08
cresylic (crude)	gal.	.80	@	
glacial, 99% (carboys)	lb.	.50	@	
muriatic, 20°	lb.	.03¼	@	
nitric, 36°	lb.	.06¾	@	
sulphuric, 60°	lb.	.02½	@	.02¾
Alumina Pigment, No. 1 (sacks and bbls.)	ton	14.00	@	19.00
Aluminum Flake (carloads)	ton	22.00	@	
Ammonium carbonate	lb.	.09½	@	.10
Antimony, crimson, sulphuret of (casks)	lb.	.80	@	.90
crimson, "Mephisto" (casks)	lb.	.85	@	
golden, sulphuret of (casks)	lb.	.75	@	
golden, sulphuret, States brand, 16-17%	lb.	.65	@	
Asbestine	ton	19.50	@	21.00
Asbestos	ton	25.00	@	
Asphaltum "G" Brilliant	lb.	.02	@	
Barium sulphate, precipitated	ton		None	
Barytes, pure white	ton	50.00	@	65.00
off color	ton	20.00	@	25.00
Basofor	ton	140.00	@	
Benzol, pure	gal.	.80	@	
Beta-Naphthol	lb.	1.25	@	
Black Hypo	lb.	.39	@	.40
Bone ash	lb.		None	
black	lb.	.03½	@	.07
Cadmium tri-sulphate			None	
yellow			None	
Cantella gum	lb.	.27½	@	.35
Carbon, bisulphide (drums)	lb.	.08½	@	
black (cases)	lb.	.30	@	
tetrachloride (drums)	lb.	.21	@	
Caustic soda, 76 per cent.	lb.	.05½	@	
Chalk, precipitated, extra light	lb.	.06	@	
precipitated, heavy	lb.	.04	@	
China clay, domestic	ton	10.00	@	12.00
imported	ton	40.00	@	
Chrome, green	lb.	.20	@	.24
yellow	lb.	.35	@	.65
Coal tar	bbl.	4.50	@	
Corn oil, refined	lb.	.10¼	@	
Cotton linters	lb.	.08¼	@	
Emarex	ton	$100.00	@	
Gas black	lb.	.22	@	.25
Gilsonite	ton	40.00	@	
Glycerine, C. P. (drums)	lb.	.60	@	
Graphite, flake (400 pound bbl.)	lb.	.20	@	
powdered (400 pound bbl.)	lb.	.05	@	
Green oxide of chromium (casks)	lb.	.75	@	
Ground glass	lb.	.02¾	@	
Indian red, reduced grades (Coulston's)	lb.	.02¾	@	.05½
pure (Coulston's)	lb.	.06¾	@	.10
Infusorial earth, powdered	ton	60.00	@	
bolted	ton	60.00	@	
Iron oxide, red, reduced grades	lb.	.02½	@	.03
red, pure, bright	lb.	.08½	@	.09
Hemingways	lb.	.08	@	
Ivory, black	lb.	.10	@	.24
Lampblack	lb.	.14	@	.18
Lead, red oxide of	lb.	.09¼	@	
sublimed blue	lb.	.08¾	@	
white, basic carbonate	lb.	.08¾	@	
white, basic sulphate	lb.	.08¾	@	
Lime, flour	lb.	.01¼	@	.01½
Litharge	lb.	.09¼	@	.11½
English	lb.	.13	@	.14
Lithopone, domestic	lb.	.15½	@	.16
Imported	lb.	.12	@	.15
Magnesia, carbonate	lb.	.40	@	.45
calcined, heavy	lb.	.10	@	
heavy, Thistle Brand	lb.	.45	@	.50
light		35.00	@	39.00
Magnesite, calcined, powdered	ton	.03½	@	.05½
Mica, powdered	lb.	.01¼	@	.03½
Mineral rubber	lb.	.24	@	
Naphtha, stove gasolene (steel bbls.)	gal.	.28	@	
66@68 degrees "	gal.	.29	@	
68@70 degrees "	gal.	.23	@	
V. M. & P "	gal.	.85	@	1.25
Oil, aniline	lb.	.77	@	.81
linseed (bbl.)	gal.	.16	@	.20
palm	gal.	.17	@	
paraffin	gal.	.60	@	
pine (cases)	gal.	1.05	@	1.15
rapeseed	gal.	.30	@	
rosin, heavy body	gal.	.18	@	
tar (cases)	gal.	3.50	@	5.00
soluble aniline colors, yellow, orange, red, violet, blue, green	lb.	.12½	@	
Orange mineral, domestic	lb.	.10	@	
Paragol	lb.	.04	@	.04½
Petrolatum	lb.	.02½	@	.04¼
Petroleum grease	lb.		None	
Pine solvent	lb.	6.50	@	
Pine tar	bbl.	.04	@	.05
Pitch, burgundy	lb.	.01¾	@	
pine	lb.	1.50	@	1.70
Plaster of paris	lb.	2.50	@	
Prussian blue	lb.	.02	@	.03
Pumice stone, powdered (bbls.)	lb.	.18	@	.20
Resin, Pontianak, refined	lb.	.13½	@	.14
granulated	lb.	.12	@	.13
fused	bbl.	4.85	@	8.50
Rosin (280 pound bbls.)	lb.	.03½	@	.05
Rotten stone, powdered	lb.	.04½	@	
Rubber black	lb.	.03	@	
Rubber compound, Richmond brand	ton	35.00	@	
No. 64 brand	lb.	.08	@	.13
Rubber substitute, black	lb.	.12½	@	.18
white	lb.	.12½	@	.18
brown	lb.	.28	@	
Rubhide	lb.	.30	@	.32
Shellac, fine orange	ton	9.50	@	15.00
Soapstone, powdered	lb.	.03¾	@	
Starch, corn, powdered	lb.	.09	@	
Sulphur chloride (drums)	cwt.	2.15	@	
Sulphur, flour, velvet, Brooklyn brand (carloads)	ton	8.50	@	15.00
Talc, American	ton	22.50	@	35.00
French	gal.	4.75	@	5.00
Toluol, pure	lb.	.02¼	@	.03½
Tripolite earth, powdered	lb.		None	
bolted	gal.	.48½	@	.49
Turpentine, pure gum spirits	gal.	.43	@	
wood	gal.	.10	@	
Venice	lb.	.10	@	.50
Ultramarine blue	lb.	1.00	@	1.25
Vermilion, brilliant	lb.	2.50	@	2.75
Chinese	lb.	2.75	@	3.00
English	lb.	.22	@	.25
Wax, bayberry	lb.	.50	@	.60
beeswax, white	lb.	.10	@	.12
ceresin, white	lb.	.25½	@	.42
carnauba	lb.	.65	@	.85
ozokerite, black	lb.	.65	@	.85
green	lb.	.30	@	.32
montan	lb.	.05½	@	.06½
paraffin, refined, 118/120 m. p. (cases)	lb.	.06	@	.07
123/125 m. p. (cases)	lb.	.06½	@	.08
128/130 m. p. (cases)	lb.	.07½	@	.09½
133/136 m. p. (cases)	lb.	.04½	@	
crude, white, 117/119 m. p. (bbls.)	lb.	.04½	@	.05
yellow, 124/126 m. p. (bbls.)	cwt.	.50	@	.60
Whiting, Alba	cwt.	.60	@	.65
commercial	cwt.	.70	@	.75
gilders	cwt.	.85	@	.90
Paris, white, American	cwt.	.90	@	1.50
English cliffstone	ton	22.00	@	
Wood pulp XXX (carloads)	lb.	.02	@	
Yellow ochre (Satin)				
Zinc oxide, American process, horsehead brand				
"special" f. o. b. factory	lb.	.11¾	@	
"XX red" f. o. b. factory	lb.	.10¾	@	
French process, green seal, f. o. b. factory	lb.	.24½	@	.24¾
red seal, f. o. b. factory	lb.	.24	@	.24½
white seal, f. o. b. factory	lb.	.25	@	.25½
Zinc oxide, white seal (Coulston's)	lb.	.30	@	
Zinc sulphide, pure	lb.		None	

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FRENCH IMPORTS AND EXPORTS OF RUBBER AND RUBBER GOODS DURING 1915.

Articles—	Imports. Pounds.	Imports. Value.	Exports. Pounds.	Exports. Value.
Crude rubber	29,256,040	$15,809,981	5,136,780	$2,775,919
Pure non-vulcanized rubber in sheets	109,780	134,907	.....	.....
Vulcanized rubber thread	442,420	582,281	.....	.....
Elastic fabrics	138,160	218,090	433,180	645,971
Rubberized fabrics in pieces	159,280	167,917	13,200	13,703
Dress shields	3,520	8,878	.....	.....
Garters, suspenders, belts	6,820	17,370	.....	.....
Card cloth	28,380	18,721	43,120	29,915
Rubberized garments	140,140	270,393	217,800	406,072
*Rubber footwear	2,209,900	1,260,097	83,820	46,899
Tires and inner tubes	790,020	1,143,525	8,729,380	11,716,837
Belting, hose and packing	1,564,200	1,098,684	1,466,300	1,015,288
Totals	34,848,660	$20,730,844	16,123,580	$16,350,604

*Does not include 872,740 pounds imported for the army.

Clarence A. Evans, of Worcester, and Charles S. Burgess, of North Brookfield, have been appointed receivers for the B. & R. Rubber Co., of North Brookfield, Mass., under a bond of $50,000. The company has liabilities of $265,000, assets, $80,000. It is understood that the receivers will operate the factory on present orders, for a month, for the purpose of determining what advantage the creditors may expect by a continuation of this policy.